Appendix D

Geotechnical Report

REPORT OF GEOTECHNICAL EVALUATION FOR ENVIRONMENTAL IMPACT REPORT

PROPOSED PRESS-TELEGRAM MIXED DEVELOPMENT PROJECT
604 PINE AVENUE
LONG BEACH, CALIFORNIA

Prepared for:

RINCON CONSULTANTS

Ventura, California

July 7, 2006

MACTEC

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engineering and constructing a better tomorrow

July7, 2006

Mr. Patrick Nichols
Rincon Consultants
790 East Santa Clara Street
Ventura, California 93001

Subject: **LETTER OF TRANSMITTAL**
Report of Geotechnical Evaluation
for Environmental Impact Report
Proposed Press-Telegram Mixed Use Development Project
604 Pine Avenue
Long Beach, California
MACTEC Project 4953-06-0971

Dear Mr. Nichols:

We are pleased to submit our report of geotechnical evaluation for use in preparing the environmental impact report for the proposed Press-Telegram Mixed Use Development Project, to be located at 604 Pine Avenue in the City of Long Beach, California. The scope of our work was performed in general accordance with our contract with you dated May 2, 2006.

Please call if you have any questions or require additional information.

Sincerely,

MACTEC Engineering and Consulting, Inc.

DRAFT

DRAFT

Rosalind Munro
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1.0 SCOPE

This report presents the results of our geotechnical evaluation for the proposed Press-Telegram Mixed Use Development project in the City of Long Beach, California. The scope of our work was performed in general accordance with our contract dated May 2, 2006.

The primary purpose of this study is to provide geotechnical information for incorporation into the Environmental Impact Report (EIR) planned to be filed for the proposed development. The results of our study are presented in this report. Our report is based on a review of previous geotechnical reports for projects in the immediate area and based on a review of available published and unpublished geologic and seismic literature pertinent to the study area. The Public Safety Element of the City of Long Beach (1975), the City of Long Beach Seismic Safety Element (revised 1989), and the Safety Element of the County of Los Angeles General Plan (1995) were reviewed as part of our scope. A list of the reports we reviewed as part of our evaluation is included in Section 5.0, Bibliography.

Our professional services have been performed using that degree of care and skill ordinarily exercised, under similar circumstances, by reputable geotechnical consultants practicing in this or similar localities. No other warranty, expressed or implied, is made as to the professional advice included in this report. This report has been prepared for Rincon Consultants to be used solely in the preparation of an Environmental Impact Report for the proposed Press-Telegram Mixed Use Development project in the City of Long Beach, California. This report has not been prepared for use by other parties, and may not contain sufficient information for purposes of other parties or other uses. The assessment of general site environmental conditions for the presence of pollutants in the soils and ground water of the site was beyond the scope of this investigation.

2.0 SITE CONDITIONS

The proposed Press-Telegram Mixed Use Development project area is located at 604 Pine Avenue in the City of Long Beach. The site is bounded by East Seventh Street to the north, East Sixth Street to the south, Pine Avenue to the west and Locust Avenue to the east in the Downtown Planned Development District of the city (see Figure 1).

The approximately 2.5 acre site is currently occupied by the historic Meeker and Press-Telegram buildings and associated structures and a surface parking lot. The parking lot is paved with asphalt concrete. The site is relatively level.

3.0 PROPOSED DEVELOPMENT

The currently proposed project consists of the development of approximately 542 residential units and approximately 20,000 square feet of ground floor commercial space and will encompass the entire approximately 2.5 acre downtown block. The project includes construction of two mixed-use high rise towers, both 22 stories and 250 feet in height. A four- to eight-story podium would surround both the towers and the general perimeter of the site. Approximately 1,084 on-site parking spaces would be provided in a new parking structure consisting of four above-ground levels and three subterranean levels, requiring excavation of approximately 35 feet below existing grade. The existing façade of the Meeker building, a City-designated historic landmark, and portions of the existing interior and exterior façade of the Press-Telegram Building, a potentially historic building, would be preserved and incorporated into the project.

4.0 GEOLOGIC AND SEISMIC CONDITIONS

4.1 GEOLOGIC SETTING

The proposed development is located on the Long Beach Plain in the coastal portion of California's Peninsular Ranges geomorphic province. This province extends northwesterly from Baja California into the Los Angeles Basin and westerly into the offshore area, including Santa Catalina, Santa Barbara, San Clemente and San Nicolas islands. The northern boundary of the province is the Transverse Ranges along the Malibu, Santa Monica, Hollywood, Raymond, Sierra Madre, and Cucamonga faults. The eastern boundary of the province is the Colorado Desert geomorphic province along the San Jacinto fault system. The Peninsular Range province is characterized by northwest/southeast trending alignments of mountains and hills and intervening basins, reflecting the influence of northwest trending major faults and folds controlling the general geologic structural fabric of the region. The Newport-Inglewood fault zone, a northwest-trending structural zone expressed at the surface by a series of discontinuous low hills, is located approximately 2 miles northeast of the site.

The topography of the site is shown on the Site Location Map, Figure 1. The geology of the region is shown in Figure 2, Geologic Map. Figure 3, Regional Faults and Seismicity, shows major faults and earthquake epicenters in Southern California with respect to the site.

4.2 GEOLOGIC MATERIALS

The site is underlain by Pleistocene age terrace deposits. These deposits consist of generally massive sand and silty sand with layers of sandy silt and clayey silt. Scattered shell fragments are often found in the sands. The sands typically have a low expansion potential however the silts and local clays could have medium to high expansion potential. The terrace deposits are underlain at depth by marine sediments of the Pliocene age Pico Formation.

4.3 GROUND WATER

The site is located in Section 36 of Township 4 South, Range 13 West and Section 1 of Township 5 South, Range 13 West in Los Angeles County. The site is not located in a ground water production area and there are no known ground-water monitoring wells nearby. Based on information from the California Division of Mines and Geology, now the California Geological Survey (1998, revised 2006), the historic high ground-water level in the site vicinity is estimated to be on the order of 10 feet beneath the existing ground surface.

Borings in the vicinity of the site encountered ground water at depths of 29 to 35 feet, which is approximately equal to sea level.

4.4 FAULTS

The numerous faults in Southern California include active, potentially active, and inactive faults. The criteria for these major groups are based on criteria developed by the California Geological Survey (formerly the California Division of Mines and Geology) for the Alquist-Priolo Earthquake Fault Zoning Program (Hart, 1999). By definition, an active fault is one that has had surface displacement within Holocene time (about the last 11,000 years). A potentially active fault is a fault that has demonstrated surface displacement of Quaternary age deposits (within the last 1.6 million years). Inactive faults have not moved in the last 1.6 million years. A list of nearby active faults (those included in CGS, 2003) and the distance in miles between the nearest point on the fault and the site, the maximum magnitude, and the slip rate for the fault, is given in Table 1. A similar list for potentially active faults is presented in Table 2. The faults in the vicinity of the site are shown in Figure 3.

Table 1
Major Named Faults Considered to be Active in Southern California

Fault (increasing distance)	Maximum Magnitude			Slip Rate (mm/yr.)	Distance From Site (miles)	Direction From Site
Newport-Inglewood Zone	7.1	(a)	SS	1.5	2.0	NE
Palos Verdes	7.3	(a)	SS	3.0	4.5	SW
Puente Hills Thrust	7.1	(a)	BT	0.7	12	NNE
San Joaquin Hills Thrust	6.6	(a)	BT	0.5	17	SE
Upper Elysian Park Thrust	6.4	(a)	RO	1.3	19	NE
Whittier	7.3	(a)	SS	2.0	19	NE
Santa Monica	6.6	(a)	RO	1.0	24	NW
Raymond	6.5	(a)	RO	1.5	24	N
Hollywood	6.4	(a)	RO	1.0	24	NNW
Verdugo	6.9	(a)	RO	0.5	26	N
San Jose	6.4	(a)	RO	0.5	26	NE
Malibu Coast	6.7	(a)	RO	0.3	27	NW
Sierra Madre	7.2	(a)	RO	2.0	29	NNE
Coronado Bank	7.6	(a)	SS	3.0	29	SSE
Northridge Thrust	7.0	(a)	BT	1.5	30	NW
Clamshell-Sawpit	6.5	(a)	RO	0.5	30	NNE
Elsinore (Glen Ivy Segment)	6.8	(a)	SS	5.0	31	E
Chino - Central Avenue	6.7	(a)	NO	1.0	31	NE
Anacapa-Dume	7.5	(a)	RO	3.0	34	WNW
San Gabriel	7.2	(a)	SS	1.0	35	NNE
San Fernando	6.7	(a)	RO	2.0	36	NNW
Cucamonga	6.9	(a)	RO	5.0	38	NE
Santa Susana	6.7	(a)	RO	5.0	41	NW
Simi-Santa Rosa	7.0	(a)	RO	1.0	47	NW
San Andreas (Mojave Segment)	7.4	(a)	SS	30.0	50	NE
Oak Ridge	7.0	(a)	RO	4.0	52	NW
San Jacinto (San Bernardino Segment)	6.7	(a)	SS	12.0	52	NE
Holser	6.5	(a)	RO	0.4	53	NE
San Cayetano	7.0	(a)	RO	6.0	63	NW

(a) CGS, 2003

SS Strike Slip
NO Normal Oblique
RO Reverse Oblique
BT Blind Thrust

Table 2
Major Named Faults Considered to be Potentially Active in Southern California

Fault (increasing distance)	Maximum Magnitude			Slip Rate (mm/yr.)	Distance From Site (miles)	Direction From Site
Los Alamitos	6.2	(b)	SS	0.1	6.2	NE
Norwalk	6.7	(e)	RO	0.1	12	NE
El Modeno	6.5	(b)	NO	0.1	17	ENE
Charnock	6.5	(e)	SS	0.1	17½	NW
Overland	6.0	(e)	SS	0.1	18	NE
Coyote Pass	6.7	(b)	RO	0.1	18½	N
Pelican Hill	6.3	(b)	SS	0.1	19½	SE
MacArthur Park	5.7	(d)	RO	0.1	20	NNW
Peralta Hills	6.5	(b)	RO	0.1	21	E
Duarte	6.7	(e)	RO	0.1	29	NNE
Indian Hill	6.6	(b)	RO	0.1	31	NE
Northridge Hills	6.6	(c)	SS	1.2	35	NW

(b) Mark, 1977
(c) Wesnousky, 1986
(d) Hummon et al., 1994
(e) Slemmons, 1979

SS Strike Slip
NO Normal Oblique
RO Reverse Oblique

Active Faults

Newport-Inglewood Fault Zone

The nearest active fault to the site is the Cherry Hill segment of the Newport-Inglewood fault zone located approximately 2 miles to the northeast. This fault zone is composed of a series of discontinuous northwest-trending en echelon faults extending from Ballona Gap southeastward past the Santa Ana River in Newport Beach, where it trends off-shore. This zone is reflected at the surface by a line of geomorphically young anticlinal hills and mesas formed by the folding and faulting of a thick sequence of Pleistocene age sediments and Tertiary age sedimentary rocks (Barrows, 1974). Fault-plane solutions for 39 small earthquakes (between 1977 and 1985) show mostly strike-slip faulting with some reverse faulting along the north segment (north of Dominguez Hills) and some normal faulting along the south segment (south of Dominguez Hills to Newport Beach) (Hauksson, 1987). Prior fault investigations by Law/Crandall (1993) in the Huntington Beach area indicate that the on-shore North Branch segment of the Newport-Inglewood fault zone offsets Holocene age alluvial deposits in the vicinity of the Santa Ana River.

Palos Verdes Fault Zone

Studies by Stephenson et al. (1995), which included geophysical studies, aerial photograph interpretation, and limited fault trenching, indicate that there are several active on-shore splays of the Palos Verdes fault zone. Geophysical data also indicate the off-shore splays of the fault are active, offsetting Holocene age deposits (Clarke et al., 1985). Based on geophysical data, the dip of the fault is interpreted to be near vertical to 55 degrees to the southwest (Stephenson et al., 1995). Vertical separations up to about 5,900 feet occur across the fault at depth. However, strike-slip movement is indicated by the configuration of the basement surface and lithologic changes in the Tertiary age rocks across the fault. No historic large magnitude earthquakes are associated with this fault. However, the fault is considered active by the California Geological Survey (CGS) and local reviewing agencies. The closest splay of the active Palos Verdes fault zone to the site is the off-shore segment, located approximately 4.5 miles to the southwest.

Elsinore Fault Zone

The active Elsinore fault zone is located approximately 31 miles northeast of the site. This fault zone extends south-southeastward at least 110 miles along the northeastern flank of the Santa Ana Mountains. The fault zone dips steeply toward the southwest and displacement is both right-lateral and reverse-dip faulting. The fault zone contains several parallel to subparallel fault segments, and characteristically occupies a trough-like depression. The CGS considers the Glen Ivy Segment to be capable of a Magnitude 6.8 earthquake and estimates an annual slip rate of 5.0 millimeters per year.

Chino-Central Avenue Fault

The Chino-Central Avenue fault extends northwesterly from the northern portion of the Elsinore fault zone for approximately 31 miles, and traverses the eastern flank of the Puente Hills. Geomorphic evidence for Pleistocene age movement is indicated along the Chino portion of the fault trace by right deflected drainages and northeast-facing scarps. The Central Avenue portion parallels the Chino fault and forms a ground-water barrier further to the north. The Chino–Central Avenue fault has recently been included in a preliminary Alquist-Priolo Earthquake Fault Zone for surface fault rupture hazards. The fault is considered active. The Chino-Central Avenue fault is located about 22 miles northeast of the site at the closest point.

Whittier Fault

The active Whittier fault is located approximately 23 miles northeast of the site. The northwest-trending Whittier fault extends along the south flank of the Puente Hills from the Santa Ana River on the southeast to Whittier Narrows on the northwest. According to Yeats, at Whittier Narrows the Whittier fault turns more northwesterly becoming the East Montebello fault. The main Whittier fault trace is a high-angle reverse fault, with the north side uplifted over the south side at an angle of approximately 70 degrees, although late Quaternary movement has been nearly pure strike slip and total right displacement may be around 8 to 9 kilometers (Yeats, 2004). In the Brea-Olinda Oil Field, the Whittier fault displaces Pleistocene age alluvium, and Carbon Canyon Creek is offset in a right lateral sense by the Whittier fault.

Coronado Bank Fault Zone

The Coronado Bank fault zone is offshore in the Continental boarderland approximately 29 miles southeast of the site. It is a right lateral strike slip fault trending to the northwest and is thought to tie into the Palos Verdes fault zone. The CGS considers the Coronado Bank fault zone to be capable of a Magnitude 7.6 earthquake and estimates an annual slip rate of 3.0 millimeters per year, based on the estimated slip rate of the Palos Verdes fault zone.

San Andreas Fault Zone

The Mojave segment of the active San Andreas fault zone is located about 50 miles northeast of the site. This fault zone is California's most prominent structural feature, trending in a general northwest direction for almost the entire length of the state. The southern segment of the fault is approximately 450 kilometers long and extends from the Transverse Ranges west of Tejon Pass on the north to the Mexican border and beyond on the south. The last major earthquake along the San Andreas fault zone in Southern California was the 1857 Magnitude 8.3 Fort Tejon earthquake.

Blind Thrust Faults

Puente Hills Blind Thrust

The Puente Hills Blind Thrust fault (PHBT) is defined based on seismic reflection profiles, petroleum well data, and precisely located seismicity (Shaw and others, 2002). This blind thrust fault system extends eastward from downtown Los Angeles to Brea (in northern Orange County). The PHBT includes three north-dipping segments, named from east to west as the Coyote Hills segment, the Santa Fe Springs segment, and the Los Angeles segment. These segments are overlain by folds expressed at the surface as the Coyote Hills, Santa Fe Springs Anticline, and the Montebello Hills. The closest point of the vertical surface projection of the PHBT is approximately 12 miles northeast of the site.

The Santa Fe Springs segment of the PHBT is believed to be the causative fault of the October 1, 1987 Whittier Narrows Earthquake (Shaw and others, 2002). Postulated earthquake scenarios for the PHBT include single segment fault ruptures capable of producing an earthquake of magnitude 6.5 to 6.6 (M_w) and a multiple segment fault rupture capable of producing an earthquake of magnitude 7.1 (M_w). The PHBT is not exposed at the ground surface and does not present a potential for surface fault rupture. However, based on deformation of late Quaternary age sediments above this fault system and the occurrence of the Whittier Narrows earthquake, the PHBT is considered an active fault capable of generating future earthquakes beneath the Los Angeles Basin. An average slip rate of 0.7 mm/yr and a maximum magnitude of 7.1 are estimated by the California Geological Survey (2003) for the Puente Hills Blind Thrust.

San Joaquin Hills Fault

Recent studies by Grant et al. (1999, 2000, and 2002) suggest that an active blind thrust fault system underlies the San Joaquin Hills in southern Orange County. The vertical surface projection of the closest point of the San Joaquin Hills fault lies approximately 17 miles southeast of the site. This postulated blind thrust fault is believed to be a faulted anticlinal fold, subparallel to the Newport-Inglewood fault zone (NIFZ) but considered a distinctly separate seismic source (Grant et al., 2002). The San Joaquin Hills are rising at an estimated average rate of 0.21 to 0.27 meters per 1,000 years. The recency of movement and Holocene slip rate of this fault are not known. However, the fault has been estimated to be capable of a Magnitude 6.8 to 7.3 earthquake. This estimation is based primarily on coastal geomorphology and age-dating of marsh deposits that are elevated above the current coastline.

The San Joaquin Hills thrust fault is not exposed at the surface and does not present a potential surface fault rupture hazard. However, the San Joaquin Hills Thrust is considered an active feature that can generate future earthquakes. The California Geological Survey (2003) estimates an average slip rate of 0.5 millimeters per year and a maximum Magnitude of 6.6 for the San Joaquin Hills Thrust.

The San Joaquin Hills Thrust has been postulated to be an on-shore extension of the Oceanside and Thirtymile Bank Thrusts, a blind thrust system identified in the California Borderlands, offshore of the Orange County and the San Diego County coastline (Rivero et al., 2000). This thrust system is believed to extend to at least the United States/Mexican border on the south. The offshore thrust system has been identified through detailed mapping of sea floor scarps, local uplift on marine terraces, and structural modeling. The 1986 Magnitude 5.3 Oceanside Earthquake has been attributed to the Oceanside Thrust (Rivero et al., 2000). Like other blind thrust faults in the Los Angeles area, the Oceanside and Thirtymile Bank Thrusts are not exposed at the surface and do not present a potential surface fault rupture hazard. The CGS does not consider the Oceanside and Thirtymile Bank Thrusts to be separate seismic sources from the San Joaquin Hills.

Upper Elysian Park Thrust

The Upper Elysian Park fault is a blind thrust fault that overlies the Los Angeles and Santa Fe Springs segments of the Puente Hills Thrust (Oskin et al., 2000 and Shaw et al., 2002). The eastern edge of the Upper Elysian Park fault is defined by the northwest-trending Whittier fault zone. The closest point of the vertical surface projection of the Upper Elysian Park fault is approximately 19 miles north-northwest of the site at its closest point. Like other blind thrust faults in the Los Angeles area, the Upper Elysian Park fault is not exposed at the surface and does not present a potential surface rupture hazard; however, the Upper Elysian Park fault should be considered an active feature capable of generating future earthquakes. An average slip rate of 1.3 millimeters per year and a maximum Magnitude of 6.4 are estimated by the California Geological Survey (2003) for the Upper Elysian Park fault.

Northridge Thrust

The Northridge Thrust, as defined by Petersen et al. (1996), is an inferred blind thrust fault that is considered the eastern extension of the Oak Ridge fault. The Northridge Thrust underlies the majority of the San Fernando Valley at depth and was the causative fault of the January 17, 1994 Northridge earthquake. The closest edge of the vertical surface projection of the Northridge Thrust is approximately 30 miles northwest of the site. This thrust fault is not exposed at the surface and does not present a potential surface fault rupture hazard. However, the Northridge Thrust is an active feature that can generate future earthquakes. The CGS (2003) estimates an average slip rate of 1.5 millimeters per year and a maximum Magnitude of 7.0 for the Northridge Thrust.

Potentially Active Faults

Los Alamitos Fault

The closest potentially active fault to the site is the Los Alamitos fault located approximately 6.2 miles to the northeast. This fault trends southeasterly from the northern boundary of the City of Lakewood to the Los Alamitos Armed Forces Reserve Center. The fault, considered a southeasterly extension of the Paramount Syncline, appears to be a vertical fault with the early Pleistocene age materials on the west side of the fault displaced up relative to the east side. There is no evidence that this fault has offset Holocene age alluvial deposits (Ziony and Jones, 1989). Additionally, the "Fault Activity Map of California" published by the California Division of Mines and Geology (Jennings, 1994) depicts this fault to be potentially active.

Norwalk Fault

The potentially active Norwalk fault is located about 12 miles northeast of the site. The fault is a known ground-water barrier along the southern edge of the Coyote Hills, trending southeasterly toward the Santa Ana Mountains. The fault is thought to be a north-dipping reverse oblique fault along which the Coyote Hills have been uplifted. This fault offsets lower Pleistocene age and older deposits near the mouth of the Santa Ana Canyon. However, there is no evidence that this fault has offset Holocene age alluvial deposits (Ziony and Jones, 1989). Additionally, Jennings, 1994 shows this fault to be potentially active.

El Modeno Fault

The potentially active El Modeno fault is located about 17 miles northeast of the site. The fault is a steeply-dipping normal fault about 9 miles long and has about 2,000 feet of uplift on its eastern side. Movement on the fault has been inferred during Holocene time, suggesting the fault is active (Ryan et al., 1982). However, Jennings, 1994 shows this fault to be potentially active and the CGS does not include it in its database.

4.5 MINERAL RESOURCES

Due to current surrounding land use, the terrace deposits underlying the site are not suitable as a potential source of aggregate. The site is located within the Wilmington oil field (California Division of Oil and Gas, 2005) however there are no known oil wells in the vicinity of the site. Access to oil reserves is by directional drilling from outside of the vicinity. Therefore, the proposed development would not result in the loss of petroleum, natural gas, or aggregate at the site.

4.6 GEOLOGIC-SEISMIC HAZARDS

Surface Fault Rupture

The site is not within a currently established Alquist-Priolo Earthquake Fault Zone for surface fault rupture hazards. The closest active fault to the site with the potential for surface fault rupture is the Newport-Inglewood fault zone located 2 miles to the northeast. The closest Alquist-Priolo Earthquake Fault Zone established for this trace of the Newport-Inglewood fault zone is located approximately 1.9 miles to the northeast.

Based on the available geologic data, active or potentially active faults with the potential for surface fault rupture are not known to be located directly beneath or projecting toward the site.

Therefore, the potential for surface rupture due to fault plane displacement propagating to the surface at the site during the design life of the buildings is considered low.

Seismicity

Earthquake Catalog Data

The seismicity of the region surrounding the site was determined from research of a computer catalog of seismic data (Southern California Seismographic Network, 2006). This database includes earthquake data compiled by the California Institute of Technology for 1932 to January 2006. We have also utilized data from 1812 to 1931 compiled by Richter and the U.S. National Oceanic Atmospheric Administration (NOAA). The search for earthquakes that occurred within 100 kilometers of the site indicates that 415 earthquakes of Magnitude 4.0 and greater occurred between 1932 and 2006; 2 earthquakes of Magnitude 6.0 or greater occurred between 1906 and 1931; and one earthquake of Magnitude 7.0 or greater occurred between 1812 and 1905. A list of these earthquakes is presented as Table 3. Epicenters of moderate and major earthquakes (Magnitude 5.0 and greater) are shown in Figure 4.

The information for each earthquake includes date and time in Greenwich Civil Time (GCT), location of the epicenter in latitude and longitude, quality of epicentral determination (Q), depth in kilometers, distance from the site in kilometers, and magnitude. Where a depth of 0.0 is given, the solution was based on an assumed 16-kilometer focal depth. The explanation of the letter code for the quality factor of the data is presented on the first page of the table.

Historic Earthquakes

A number of earthquakes of moderate to major magnitude have occurred in the Southern California area within the last almost 100 years. A partial list of these earthquakes is included in the following table.

List of Historic Earthquakes

Earthquake (Oldest to Youngest)	Date of Earthquake	Magnitude	Distance to Epicenter (Miles)	Direction to Epicenter
Near San Bernardino	September 20, 1907	6.0	68	NE
Lake Elsinore	May 15, 1910	6.0	46	ENE
Near San Jacinto	April 18, 1918	6.8	77	E
Near Redlands	July 23, 1923	6.3	65	NE
Long Beach	March 10, 1933	6.4	16	NW
San Clemente Island	December 26, 1951	5.9	66	SSW
Tehachapi	July 21, 1952	7.5	97	NW
San Fernando	February 9, 1971	6.6	45	NNW
Whittier Narrows	October 1, 1987	5.9	21	NNW
Sierra Madre	June 28, 1991	5.8	36	NNW
Landers	June 28, 1992	7.3	105	NE
Big Bear	June 28, 1992	6.4	83	NE
Northridge	January 17, 1994	6.7	36	NE
Hector Mine	October 16, 1999	7.1	124	NE

Liquefaction

Liquefaction is the process in which loose granular soils below the ground-water table temporarily lose strength during strong ground shaking as a consequence of increased pore pressure and thereby, reduced effective stress (Applied Technology Council, 1996). The vast majority of liquefaction hazards are associated with sandy soils and silty soils of low plasticity (California Division of Mines and Geology, 1997). Potentially liquefiable soils (based on composition) must be saturated or nearly saturated to be susceptible to liquefaction (California Division of Mines and Geology, 1997).

Significant factors that affect liquefaction include water level, soil type, particle size and gradation, relative density, confining pressure, intensity of shaking, and duration of shaking. Liquefaction potential has been found to be the greatest where the ground water level is shallow and submerged loose, fine sands occur within a depth of about 50 feet or less. Liquefaction potential decreases with increasing grain size and clay and gravel content, but increases as the ground acceleration and duration of shaking increase.

According to the County of Los Angeles Safety Element (1990), the City of Long Beach Seismic Safety Element of the General Plan (1988), and the California Division of Mines and Geology (1999), the site is not within an area identified as having a potential for liquefaction. Based on information from the California Division of Mines and Geology (2001), ground water has historically been less than a depth of 50 feet below the existing ground surface. Ground water levels have recently been encountered at depths of 29 to 35 feet and the historic high reported by the CGS is at a depth of around 10 feet. The terrace deposits underlying the site are dense, however, and not susceptible to liquefaction and, therefore, the potential for liquefaction to occur at the site is low.

Seismic-induced settlement is often caused by loose to medium-dense granular soils densified during ground shaking. Uniform settlement beneath a given structure would cause minimal damage; however, because of variations in distribution, density, and confining conditions of the soils, seismic-induced settlement is generally non-uniform and can cause serious structural damage. Dry and partially saturated soils as well as saturated granular soils are subject to seismic-induced settlement. The terrace deposits are generally dense and are not considered susceptible to significant seismic induced settlement.

Slope Stability

The site is relatively level. There are no known landslides at the site, nor is the site in the path of any known or potential landslides. The site is not within an area identified as having a potential for slope instability in the City of Long Beach Safety Element of the General Plan (1988). The site is not within a California Division of Mines and Geology (1998) Seismically Induced Landslide Hazard Zone. The terrace deposits are generally uncemented and susceptible to erosion. If constructed at angles greater than approximately 2:1 (horizontal to vertical), temporary cut slopes may be susceptible to sloughing and failure.

Tsunamis, Inundation, and Seiches

The site located approximately 1 mile from San Pedro Bay and topography at the site is Elevation 35. According to the City of Long Beach Seismic Safety Element (1988) and the County of Los Angeles Seismic Safety Element (1990), the site is not located within a tsunami run-up zone. Recent discussions in the scientific community, however, suggest that the tsunami hazard may be greater than previously anticipated. Government agencies are currently upgrading the region's tsumani preparedness, warning, and evacuation systems.

According to the City of Long Beach Seismic Safety Element (1988) and County of Los Angeles Seismic Safety Element (1990), the site is not located downslope of any large bodies of water that could adversely affect the site in the event of earthquake-induced dam failures or seiches (wave oscillations in an enclosed or semi-enclosed body of water).

Flooding

The site is not within a flood influence area of the City of Long Beach Seismic Safety Element (1988) or the County of Los Angeles Seismic Safety Element (1990).

Expansive and Corrosive Soils

The terrace deposit sands typically have a low expansion potential; however, the silts and local clays could have medium to high expansion potential. Testing of soils from a nearby site indicated the soils were considered severely corrosive to ferrous metals and deleterious to copper and concrete. The potential for onsite soils to exhibit similar corrosive properties is moderate to high.

Oil Wells and Methane Gas

According to maps published by the California Division of Oil and Gas (CDOG, 2005), the site is located within the limits of the Wilmington Oil Field. According to CDOG maps, there are no known wells in the vicinity of the site. Since the site is within the boundaries of an oil field, there is a potential that documented abandoned wells or other undocumented wells could be encountered during the proposed site development. Any wells encountered during construction will have to be abandoned in accordance with current CDOG standards and regulations.

Since the site is located within the Wilmington Oil Field, there is a potential for methane and other volatile gases to occur beneath the site. If testing indicates that methane is present at the site, a permanent methane gas control system may be necessary beneath the proposed buildings at the site. If necessary, a methane gas consultant should be retained for the design of such a system.

Subsidence

The site is not located within an area of known subsidence associated with ground water withdrawal, peat oxidation or hydro-compaction. However, the site is located within an area of known subsidence associated with fluid withdrawal during petroleum production. Subsidence in the Long Beach area as a result of oil production is well documented and was noted as early as 1940. Surveys conducted within the Long Beach area revealed an elliptical zone of subsidence with up to 29 feet of settlement (elevation loss) at its center by 1970. According to contours of subsidence published by City of Long Beach, Department of Oil Properties (1971), up to 4 feet of subsidence has been documented in the vicinity of the site. Since the 1950s, fluid injection to repressurize the oil field has been ongoing. Since that time, there has been a steady decline in the rate of subsidence, approaching zero in the late 1960s or early 1970s. Based on the ongoing fluid injection program and the regional nature of the subsidence, the potential for subsidence to affect the proposed development or specific structures is considered to be low.

Volcanic Hazards

The site is not subject to any known volcanic hazards.

4.7 SUMMARY OF POTENTIAL GEOLOGIC-SEISMIC IMPACTS

Surface Fault Rupture

Due to the reasons previously described, the potential for surface fault rupture at the site is low. Based on the available geologic data, active or potentially active faults with the potential for surface fault rupture are not known to cross or project toward the site. Therefore, the proposed development will not result in significant impacts related to surface fault rupture.

Seismicity and Ground Shaking

The location of the site relative to known active or potentially active faults indicates the site could be subjected to significant ground shaking. This hazard is common in Southern California and the effects of ground shaking can be mitigated by proper engineering design and construction in conformance with current building codes and engineering practices.

Liquefaction

The project site is not within an area identified as having a potential for liquefaction (City of Long Beach Safety Element of the General Plan, 1988 and the California Division of Mines and Geology, 1998). The site soils are not considered susceptible to liquefaction and the hazard is considered low.

Settlement

Seismic-induced settlement is often caused by loose to medium-dense granular soils densified during ground shaking. The terrace deposits are generally dense and are not considered to be susceptible to significant seismic induced settlement.

Slope Stability

There are no known landslides at the site, nor is the site in the path of any known or potential landslides. The site is not within an area identified as having a potential for slope instability in the City of Long Beach Safety Element of the General Plan (1988). The site is not within an area identified by the California Division of Mines and Geology (1998) as having a potential for seismic slope instability (slope instability resulting from ground shaking).

Ground Water

Ground water has been encountered in borings at nearby sites at depths of 29 to 35 feet. According to the CGS (1998), the historic high ground-water depth is estimated around 10 feet. Excavations for underground parking, deep foundations, or deep utilities may encounter ground water. Dewatering may be necessary for excavations. Testing of ground water to be discharged offsite will be necessary and proper disposal or treatment may be necessary if the ground water does not meet regulatory standards. Waterproofing will be needed for underground structures sensitive to moisture or inundation. Underground structures will need to be designed for the hydrostatic pressures of potential ground water unless permanent dewatering systems are installed.

Expansive and Corrosive Soils

The terrace deposit sands typically have a low expansion potential, however, the silts and local clays could have medium to high expansion potential. Testing of soils from a nearby site indicated the soils were considered severely corrosive to ferrous metals and deleterious to copper and concrete. The potential for onsite soils to exhibit similar corrosive properties is moderate to high.

Tsunamis, Inundation, and Seiches

According to the City of Long Beach Safety Element of the General Plan (1988) and County of Los Angeles Safety Element (1995), the site is not within a potential tsunami inundation hazard zone. Recent discussions in the scientific community, however, suggest that the tsunami hazard in California may be greater than previously anticipated. Government agencies are currently upgrading the region's tsunami preparedness, warning, and evacuation systems.

Flooding

The site is not within a flood influence area of the City of Long Beach Seismic Safety Element (1988) or the County of Los Angeles Seismic Safety Element (1990).

Oil Wells and Methane Gas

According to maps published by the California Division of Oil and Gas (CDOG, 2005), the site is located within the Wilmington Oil Field. According to CDOG maps, there are no known wells in the vicinity of the site, but the site is within the boundaries of an oil field and there is a potential that documented abandoned wells or other undocumented wells could be encountered during the proposed site development. There is a potential for methane and other volatile gases to occur beneath the site.

Subsidence

The site is not located within an area of known subsidence associated with ground water withdrawal, peat oxidation or hydro-compaction. However, the site is located within an area of known subsidence associated with fluid withdrawal during petroleum production. Since the 1950s, fluid injection to repressurize the oil field has been ongoing and there has been a steady decline in the rate of subsidence, approaching zero in the late 1960s or early 1970s. Based on the ongoing fluid injection program and the regional nature of the subsidence, the potential for subsidence to affect the proposed development or specific structures is considered to be low. Significant impacts related to subsidence are not anticipated by the proposed development.

Mineral Resources

Due to current surrounding land use, the terrace deposits underlying the site are not suitable as a potential source of aggregate. The site is located within the Wilmington oil field (California Division of Oil and Gas, 2005) however there are no know oil wells in the vicinity of the site. Access to oil reserves is by directional drilling from outside of the vicinity. Therefore, the proposed development would not result in the loss of petroleum, natural gas, or aggregate at the site.

Landform Alteration

There are no unique geologic features in the vicinity of the site. Therefore, no unique geologic features will be modified or destroyed as a result of the proposed development.

Volcanic Hazards

Due to the distance between the site and known active volcanic areas, there are no significant impacts related to volcanic hazards at the site. The proposed development will not result in or expose people to significant impacts related volcanic hazards.

4.8 MITIGATION MEASURES FOR POTENTIAL GEOLOGIC-SEISMIC IMPACTS

General

As part of the mitigation measures for the development as a whole, the proposed project will be designed and built in compliance with City of Long Beach building code requirements. The City of Long Beach will require that the results of a comprehensive geotechnical investigation be submitted as part of the permitting process for the project. The City of Long Beach will require that the specific design recommendations presented in the comprehensive geotechnical report be incorporated into the design and construction of the proposed project.

Proper engineering design and conformance with recommendations presented in the comprehensive geotechnical report for the project, in compliance with current building codes as required by the City of Long Beach, will reduce the identified potential geotechnical impacts to a level that is less than significant.

Seismicity and Ground Shaking

The potential for significant ground shaking is common in Southern California and the effects of ground shaking can be mitigated by proper engineering design and construction in conformance with current building codes and engineering practices.

Slope Stability

If constructed at angles greater than approximately 2:1, temporary cut slopes in terracec deposits are susceptible to sloughing and failure. Temporary shoring can be designed to protect the temporary excavations, structures to remain in place, and adjacent properties.

Ground Water

Excavations for underground parking, deep foundations, or deep utilities may encounter ground water. Dewatering may be necessary for excavations. Testing of ground water to be discharged offsite will be necessary and proper disposal or treatment may be necessary if the ground water does not meet regulatory standards. Waterproofing will be needed for underground structures sensitive to moisture or inundation. Underground structures will need to be designed for the hydrostatic pressures of potential ground water unless permanent dewatering systems are installed.

Expansive and Corrosive Soils

Testing of site soils will need to be performed and structures and site improvements will need to be designed to resist the effects of expansive and corrosive soils.

Tsunamis

Recent discussions in the scientific community suggest that the tsunami hazard in California may be greater than previously anticipated. Government agencies are currently upgrading the region's tsumani preparedness, warning, and evacuation systems.

Oil Wells and Methane Gas

Any abandoned wells or other undocumented wells encountered during the proposed site development will have to be abandoned in accordance with current CDOG standards and regulations.

Since the site is located within the Wilmington Oil Field, there is a potential for methane and other volatile gases to occur beneath the site. If testing indicates that methane is present at the site, a permanent methane gas control system may be necessary beneath the proposed buildings at the site. If necessary, a methane gas consultant should be retained for the design of such a system.

5.0 BIBLIOGRAPHY

Anderson, J. G., 1984, "Synthesis of Seismicity and Geologic Data in California," U.S. Geological Survey Open File Report 84-424.

Anderson, J. G., and Luco, J. E., 1983, "Consequences of Slip Rate Constraints on Earthquake Occurrence Relations," *Bulletin of the Seismological Society of America,* Vol. 73, No. 2, p. 471-496.

Barrows, A. G., 1974, "A Review of the Geology and Earthquake History of the Newport-Inglewood Structural Zone, Southern California," California Division of Mines and Geology Special Report 114.

Barrows, A. G., 1973, "Earthquakes Along the Newport–Inglewood Structural Zone," California *Geology*, Vol. 26, No. 3.

Bryant, W. A., 1988, "Recently Active Traces of the Newport-Inglewood Fault Zone, Los Angeles and Orange Counties, California," California Division of Mines and Geology Open File Report 88-14.

Bryant, W. A., 1985, "Northern Newport-Inglewood Fault Zone, Los Angeles County, California", *California Division of Mines and Geology, Fault Evaluation Report FER-173.*

Bullard, T. R. and Lettis, W. R., 1993, "Quaternary Fold Deformation Associated with Blind Thrust Faulting, Los Angeles Basin, California," *Journal of Geophysical Research,* Vol. 98, No. B5, pp. 8349-8369.

California Code of Regulations, Title 24, 1995 California Building Code, 3 volumes. (*Reference is made to Chapter 16, Division III, Earthquake Design; Chapter 18, Foundations and Retaining Walls; and Chapter A-33, Excavation and Grading.).*

California Department of Water Resources, 2006, http://wdl.water.ca.gov/gw/hyd/rpt_township_data_CF.cfm.

California Division of Mines and Geology, 1999, "State of California Seismic Hazard Zones, Long Beach Quadrangle, Official Map".

California Division of Mines and Geology, 1998, "Seismic Hazard Zone Report for the Long Beach 7.5-Minute Quadrangle, Los Angeles County, California" Seismic Hazard Zone Report 028.

California Division of Mines and Geology, 1997, "Guidelines for Evaluating and Mitigating Seismic Hazards in California," Special Publication 117.

California Division of Mines and Geology, 1996, "Probabilistic Seismic Hazard Assessment for the State of California," Open File Report 96-08.

California Division of Mines and Geology, 1994, "Guidelines for Evaluating the Hazard of Surface Fault Rupture," DMG Note 49.

California Division of Mines and Geology, 1986, "State of California Special Studies Zones, Long Beach Quadrangle, Official Map" July 1, 1986.

California Division of Oil and Gas, 2005, "Regional Wildcat Map, Southern Los Angeles Basin, Los Angeles and Orange Counties, California" Map W 1-6.

California Division of Oil and Gas, 2005, Map 131.

California Geological Survey, 2003, "The Revised 2002 California Probabilistic Seismic Hazard Maps, June 2003, Appendix A – 2002 California Fault Parameters".

California Institute of Technology, 2006, Catalog of Earthquakes for Southern California, 1932-2006.

Cao, T., Bryant, W.A., Rowshandel, B., Branum, D., and Wolls, C.J., 2003, "Probabilistic Seismic Hazard Assessment Maps, June 2003", California Geological Survey.

Clarke, S. H., Greene, H. G., and Kennedy, M. P., 1985, "Identifying Potentially Active Faults and Unstable Slopes Offshore," in Ziony, J.I., ed., *Evaluating Earthquake Hazards in the Los Angeles Region–An Earth-Science Perspective, U.S. Geological Survey Professional Paper 1320*, p. 347-373.

Cramer, C. H., Petersen, M. D., and Reichle, M. S., 1996, "A Monte Carlo Approach in Estimating Uncertainty for a Seismic Hazard Assessment of Los Angeles, Ventura, and Orange Counties, California," *Bulletin of Seismological Society of America,* Vol. 86, No. 6, pp. 1681-1691.

Cramer, C. H. and Petersen, M. D., 1996, "Predominant Seismic Source Distance and Magnitude Maps for Los Angeles, Orange, and Ventura Counties, California," *Bulletin of Seismological Society of America,* Vol. 86, No. 5, pp. 1645-1649.

Crook, R., Jr., Proctor, R. J., and Lindvall, E. E., 1983, "Seismicity of the Santa Monica and Hollywood Faults Determined by Trenching," Technical Report to the U.S. Geological Survey, Contract No. 14-08-001-20523, p. 26.

Crook, R., Jr., Allen, C. R., Kamb, B., Payne, C. M., and Proctor, R. J., 1987, "Quaternary Geology and Seismic Hazard of the Sierra Madre and Associated Faults Western San Gabriel Mountains," in U.S. Geological Survey Professional Paper 1339, Ch. 2, pp. 27–63.

Crook, R., Jr., and Proctor, R. J., 1992 "The Santa Monica and Hollywood Faults and the Southern Boundary of the Transverse Ranges Province" in Engineering Geology Practice in Southern California.

Davis, J. F. Bennett, J. H., Borchardt, G. A., Kahle, J. E., Rice, S. J., Silva, M. A., 1982, "Earthquake Planning Scenario for a Magnitude 8.3 Earthquake on the San Andreas Fault in Southern California," California Division of Mines and Geology Special Publication 60.

Dolan, J. F. et. al., 1995, "Prospects for Larger or More Frequent Earthquakes in the Los Angeles Metropolitan Region, California," *Science*, Vol. 267, 199-205 pp.

Dolan, J. F. and Sieh K., 1993, "Tectonic Geomorphology of the Northern Los Angeles Basin: Seismic Hazards and Kinematics of Young Fault Movement," In Ehlig, P.L., and Steiner, E.A., eds., Engineering Geology Field Trips: Orange County, Santa Monica Mountains, and Malibu, Guidebook and Volume: Berkley, California, Association of Engineering Geologists, p. B-20-26.

Durham, D. L., and Yerkes, R. F., 1964, "Geology and Oil Resource of the Eastern Puente Hills Areas, Southern California," U. S. Geological Survey Professional Paper 420-B.

FEMA, 1998, "Flood Insurance Rate Map, City of Long Beach, CA, Los Angeles County, Panel 20 of 35."

Grant, L. B., Ballenger, L. J., and Runnerstrom, E. E., 2002, "Coastal Uplift of the San Joaquin Hills, Southern Los Angeles Basin, California, by a Large Earthquake Since A. D. 1635", *Bulletin of the Seismological Society of America,* Vol. 92, No. 2, pp. 590-599.

Grant, L. B., Mueller, K. J., Gath, E. M., and Munro, R., 2000, "Late Quaternary Uplift and Earthquake Potential of the San Joaquin Hills, Southern Los Angeles Basin, California: Reply" *Geology,* Vol. 28, No. 4, p384.

Grant, L. B., Mueller, K. J., Gath, E. M., Cheng, H., Edwards, R.E., and Munro, R., 1999, "Late Quaternary Uplift and Earthquake Potential of the San Joaquin Hills, Southern Los Angeles Basin, California" *Geology,* Vol. 27, p. 1031-1034.

Hart, E. W., 1973, revised 1999, "Fault-Rupture Hazard Zones in California," California Division of Mines and Geology Special Publication 42.

Hauksson, E., 1987, "Seismotectonics of the Newport-Inglewood Fault Zone in the Los Angeles Basin, Southern California," *Bulletin of the Seismological Society of America*, Vol. 77, pp. 539–561.

Hauksson, E., 1990, Earthquakes, Faulting, and Stress in the Los Angeles Basin," *Journal of Geophysical Research*, Volume 95, No. B10, pp. 15,365–15,394.

Hummon, C., Schneider, C. L., Yeats, R. S., Dolan, J.F., Sieh, K. E., and Huftile, G. J., 1994, "Wilshire Fault: Earthquakes in Hollywood?," *Geology,* Vol. 22, pp. 291-294.

Hummon, C., Schneider, C. L., Yeats, R., and Huftile, G. J., 1992, "Active Tectonics of the Northern Los Angeles Basin: An Analysis of Subsurface Data," in Stout, M. L., ed., Proceedings of the 35th Annual Meeting of the Association of Engineering Geologists, Long Beach, California, pp. 645-654.

Jackson, D. D., et al., 1995, "Seismic Hazards in Southern California: Probable Earthquakes, 1994 to 2024," *Seismological Society of America Bulletin,* Volume 85, Number 2.

Jennings, C. W., 1994, "Fault Activity Map of California and Adjacent Areas with Locations and Ages of Recent Volcanic Eruptions," California Division of Mines and Geology Map No. 6.

Kramer, S. L., 1996, "Geotechnical Earthquake Engineering," Prentice Hall.

Law/Crandall, 1999, "Report of Geotechnical Investigation, Proposed Hotel D'Orsay Development, 201 The Promenade, Long Beach, California," Project No. 70131-9-0146.0001.

Law/Crandall, 1993, "Report of Potential Fault Displacements, Wastewater Treatment Plant Number 2, Huntington Beach, California, for County Sanitation Districts of Orange County," Project No. 2661.30140.0001.

LeRoy Crandall and Associates, 1986, "Geotechnical Report, Long Beach Alignment," LCA Project No. ADE-85005-10.

LeRoy Crandall and Associates, 1985, "Foundation Investigation, Proposed IDM Buffums Project, Broadway between Pacific and Pine Avenues, Long Beach, California," LCA Project No.AE-85039.

LeRoy Crandall and Associates, 1983a, "Completion of Exploration Program, Proposed Sunset Bay Condominium Development, Ocean Boulevard Between 7th and 8th Places, Long Beach, California," LCA Project No.A-82148-B.

LeRoy Crandall and Associates, 1983b, "Report of Geotechnical Investigation, Proposed Sunset Bay Condominium Development, Ocean Boulevard Between 7th and 8th Places, Long Beach, California," LCA Project No.A-82148-B.

LeRoy Crandall and Associates, 1982, "Supplement to Preliminary Foundation Investigation, Proposed Condominium Development, Ocean Boulevard Between 7th and 8th Place, Long Beach, California," LCA Project No.A-82148.

LeRoy Crandall and Associates, 1981, "Report of Foundation Investigation, Proposed Parking Structure Site Bound by Broadway, Elm Avenue, First Street, and Alamo Court, Long Beach, California," LCA Project No.A-81140.

LeRoy Crandall and Associates, 1977, "Report of Foundation Investigation, Proposed District Teaching Resources Center, Boyd Center, Locust Avenue and 9th Street, Long Beach, California," LCA Project No. A-77177.

LeRoy Crandall and Associates, 1963, "Report of Foundation Investigation, Proposed Safeway Store No. 187, Pacific Avenue and Fourth Street, Long Beach, California," LCA Project No. 63142.

Long Beach, City of, 1988, "Seismic Safety Element of the General Plan".

Long Beach, City of, Department of Oil Properties, 1971, "Subsidence 1928-1970", prepared by D. R. Allen.

Los Angeles, County of, 1975, Draft revision 1990, "Seismic Safety Element."

Los Angeles, County of, 1990, "Technical Appendix to the Safety Element of the Los Angeles County General Plan," Draft Report by Leighton and Associates with Sedway Cooke Associates.

Los Angeles Department of Public Works, 2006, http://ladpw.org/services/water/index.cfm.

McNeilan. T. W., Rockwell, T. K., and Resnick, G. S., 1996, "Style and Rate of Holocene Slip, Palos Verdes Fault, Southern California," *Journal of Geophysical Research,* April 10, 1996, Vol. 101, No. B4, pp. 8317-8334.

Petersen, M. D., Bryant, W. A., Cramer, C. H., Cao, T., Reichle, M. S., Frankel, A. D., Lienkaemper, J. J., McCrory, P. A., and Schwatz, D. P., 1996, "Probabilistic Seismic Hazard Assessment for the State of California," California Division of Mines and Geology Open File Report 96-08.

Petersen, M. D. and Wesnousky, S. G., 1994, "Fault Slip Rate and Earthquake Histories for Active Faults in Southern California," *Bulletin of the Seismological Society of America,* Vol. 84, pp. 1608-1649.

Poland, J. R. and Piper, A. M., 1959, "Ground-water Geology of the Coastal Zone, Long Beach-Santa Ana Area, California," U.S. Geological Survey Water Supply Paper 1109.

Rivero, C., Shaw, J. H., and Mueller, K., 2000, "Oceanside and Thirtymile Bank Blind Thrusts: Implications for Earthquake Hazards in Coastal Southern California" *Geology*, Vol. 28, No. 10.

Ryan, J. A., Burke, J. N., Walden, A. F., and Wieder, D. P., 1982, "Seismic Refraction Study of the El Modeno Fault, Orange County, California," *California Geology,* Vol.35, No. 2.

Sadigh, K., Chang, C. Y., Egan, J. A., Makdisi, F., and Youngs, R. R., 1997, "Attenuation Relationships for Shallow Crustal Earthquakes Based on California Strong Motion Data," *Seismological Research Letters*, Vol. 68, No. 1.

Schneider, C. L., Hummon, C., Yeats, R. S., and Huftile, G. L., 1996, "Structural Evolution of the Northern Los Angeles Basin, California, Based on Growth Strata," *Tectonics,* Vol. 15, No. 2, pp. 341-355.

Schoellhamer, J. E., Vedder, J. G., Yerkes, R. F., and Kinney, D. M., 1981, "Geology of the Northern Santa Ana Mountains, California", U. S. Geological Survey Professional Paper 420-D.

Shaw, J. H. and Suppe, J., 1996, "Earthquake Hazards of Active Blind Thrust Faults Under the Central Los Angeles Basin, California," *Journal of Geophysical Research,* Vol. 101, No. B4, pp. 8623-8642.

Shaw, J. H., 1993, "Active Blind-Thrust Faulting and Strike-Slip Folding in California," Ph.D. Thesis, Princeton University, Princeton, New Jersey, 216 pp.

Sieh, K. E., 1984, "Lateral Offsets and Revised Dates of Large Pre-historic Earthquakes at Pallett Creek, California," *Journal of Geophysical Research*, Vol. 9, pp. 7461-7670.

Slemmons, D. B., 1979, "Evaluation of Geomorphic Features of Active Faults for Engineering Design and Siting Studies," Association of Engineering Geologists Short Course.

Southern California Seismographic Network, 2006, "Southern California Earthquake Catalog," http://www.scecdc.scec.org/ftp/catalogs/SCSN/.

Stephenson, W. J., Rockwell, T. K., Odum J. K., Shedlock,K. M., and Okaya, D. A., 1995, "Seismic Reflection and Geomorphic Characterization of the Onshore Palos Verdes Fault Zone, Los Angeles, California," *Bulletin of the Seismological Society of America,* Vol. 85, no. 3.

U.S. Geological Survey, 1964, "Long Beach 7.5-Minute Quadrangle Map," photorevised 1981.

Wallace, R. E., 1968, "Notes of Stream Channel Offset by San Andreas Fault, Southern Coast Ranges, California," in Dickinson, U. R., and Grantz, A., eds., Proceedings of Conference of Geologic Problems on San Andreas Fault System, Stanford University Publications, *Geological Sciences*, Vol. IX, p. 6-21.

Wells, D. L., and Coppersmith, K. J., 1994, "New Empirical Relationships Amoung Magnitude, Rupture Length, Rupture Width, Rupture Area, and Surface Displacement," *Bulletin of the Seismological Society of America,* Volume 84, No. 4, pp. 974-1002.

Wesnousky, S. G., 1986, "Earthquakes, Quaternary Faults and Seismic Hazard in California," *Journal of Geophysical Research*, Vol. 91, No. B12, pp. 12,587-12,631.

Working Group on California Earthquake Probabilities, 1995, "Seismic Hazards in Southern California: Probable Earthquakes, 1994 to 2024," *Bulletin of the Seismological Society of America,* Vol. 85, No. 2, pp. 379-439.

Wright, T. L., 1991, "Structural Geology and Tectonic Evolution of the Los Angeles Basin, California," American Association of Petroleum Geologists, Memoir 52, pp. 35-134.

Yeats, R.S., 2004, "Tectonics of the San Gabriel Basin and Surroundings, Southern California," *Geological Society of America Bulletin,* Vol. 116, No. 9/10, pp. 1158-1182.

Yerkes, R. F., 1972, "Geology and Oil Resources of the Western Puente Hills Area, Southern California," U.S. Geological Survey Professional Paper 420-C.

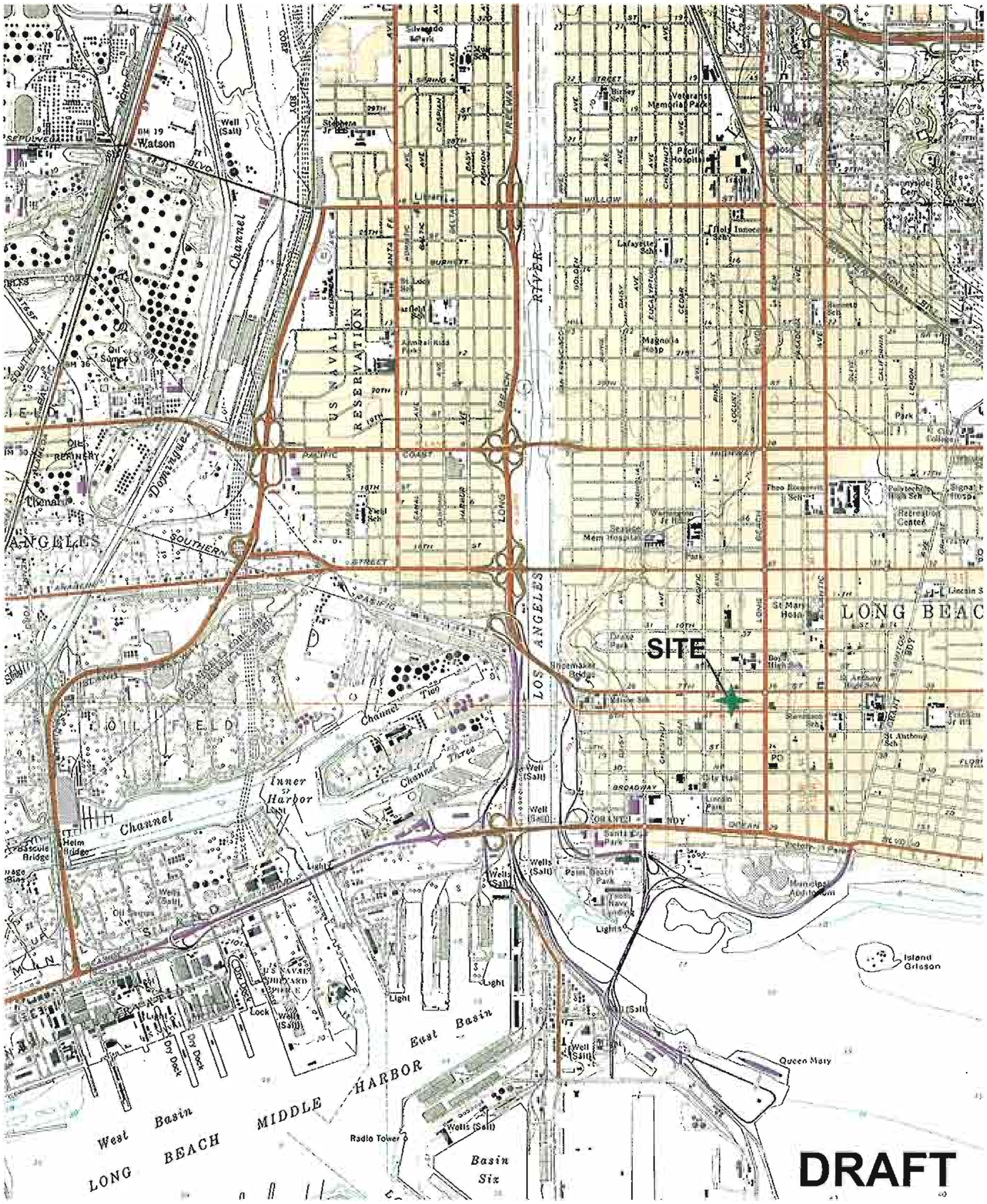
Yerkes, R. F., McCulloch, T. H., Schoellhamer, J. E., and Vedder, J. G., 1965, "Geology of the Los Angeles Basin–An Introduction," *U.S. Geological Survey Professional Paper 420-A.*

Youd, T. L. and Idriss, I. M., 1997: "Proceedings of the NCEER Workshop on Evaluation of Liquefaction Resistance of Soils," Salt Lake City, UT, January 5-6, 1996, NCEER Technical Report NCEER-97-0022, Buffalo, NY.

Ziony, J. I., and Jones, L. M., 1989, "Map Showing Late Quaternary Faults and 1978–1984 Seismicity of the Los Angeles Region, California," U.S. Geological Survey Miscellaneous Field Studies Map MF-1964.

Ziony, J. I., ed., 1985, "Evaluating Earthquake Hazards in the Los Angeles Region–An Earth Science Perspective," U.S. Geological Survey Professional Paper 1360.

FIGURES



Base: USGS, 1964, Long Beach 7 ½ Minute Quadrangle, Photorevised 1981

1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 KILOMETER

CONTOUR INTERVAL 5 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
DEPTH CURVES AND SOUNDINGS IN FEET—DATUM IS MEAN LOWER LOW WATER
THE RELATIONSHIP BETWEEN THE TWO DATUMS IS VARIABLE
SHORELINE SHOWN REPRESENTS THE APPROXIMATE LINE OF MEAN HIGH WATER
THIS MEAN RANGE OF TIDE IS APPROXIMATELY 4 FEET

N

MACTEC

MACTEC ENGINEERING AND CONSULTING, INC.
200 CITADEL DRIVE ◻ LOS ANGELES, CALIFORNIA 90040
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Figure 1 - Site Location Map

JOB NO.: 4953-06-0971	REVISIONS:
DATE: 7/7/06	
SCALE:	
DRAWN BY: RM	
CHECKED BY:	

CENOZOIC

QUATERNARY

HOLOCENE

af	Artificial fill
Qw	Active channel and wash deposits
Qa	Alluvial flood plain deposits
Qls	Landslide deposits
Qb	Beach deposits
Qe	Eolian deposits
Qpe	Paralic estuarine deposits
Qyf	Young alluvial fan and valley deposits, undivided a = sand, s = silt, c = clay
Qyf2	Young alluvial fan deposits, unit 2
Qyf1	Young alluvial fan deposits, unit 1
Qya	Young alluvial flood plain deposits, unit 1
Qye	Young eolian deposits
Qype	Young paralic estuarine deposits

PLEISTOCENE

Qof	Old alluvial fan and valley deposits, undivided a = sand, s = silt, c = clay
Qoa	Old alluvial flood plain deposits, undivided
Qoe	Old eolian deposits
Qom	Old marine deposits, undivided
Qop	Old paralic deposits, undivided, a = sand, s = silt, c = clay
Qlh	La Habra Formation
	San Pedro Formation
Qsp	San Pedro Formation, undivided
Qspt	Timms Point Silt Member
Qspl	Lomita Marl Member
Qi	Inglewood Formation

TERTIARY

PLIOCENE

	Fernando Formation
Tfu	Upper Member
Tfl / Tflc	Lower Member, Tflc = conglomerate
	Puente Formation
Tpsc / Tpscc	Sycamore Canyon Member, Tpscc = conglomerate

MIOCENE

Tpy	Yorba Member
Tps	Soquel Member
Tpv	La Vida Member
	Monterey Formation
Tmm	Malaga Mudstone Member
Tmvd	Valmonte Diatomite Member
	Volcanic rocks within the Monterey Formation
Tma	Altamira Shale Member

MESOZOIC

CRETACEOUS JURASSIC

mcs	Catalina Schist

Offshore Region

Qms	Unconsolidated shelf sediment
Qmf	Unconsolidated flank sediment
Qmb	Unconsolidated basin sediment
Qmr	Unconsolidated ridge sediment
Qmc	Unconsolidated canyon sediment
Qct	Canyon terrace
Qcf	Canyon fill
Qgf	Gully fill
Qf	Fan deposits
Qls	Landslide deposits
Qp	Pleistocene sedimentary deposits, undivided
QTt	Plio-Pleistocene terrace deposits
Tp	Pliocene sedimentary rocks, undivided*
Tmp	Mio-Pliocene sedimentary rocks, undivided*
Tu	Tertiary sedimentary and volcanic rocks, undivided*
Tmu	Miocene sedimentary rocks, undivided*
Tmv	Miocene volcanic rocks*
ms	Metamorphic rocks of pre- Late Cretaceous age*

* Q/ = Map unit overlain by more than 3 meters of unconsolidated Quaternary sediment.

MAP SYMBOLS

Contact - accuracy of location ranges from well located to inferred. All offshore contacts are considered approximately located.

U D ? Fault - solid where well located; dashed where approximately located or inferred; dotted where concealed; queried where continuation or existence is uncertain. Where age was determined in offshore area, age symbol is shown astride fault and relative offset is shown by U, upthrown side; D, downthrown side (relative or apparent). Age of faults are indicated as follows:

- cuts strata of Holocene age
- cuts strata of Pleistocene age
- cuts strata of Quaternary age
- △ cuts strata of Pliocene age
- ▲ cuts Miocene or older strata

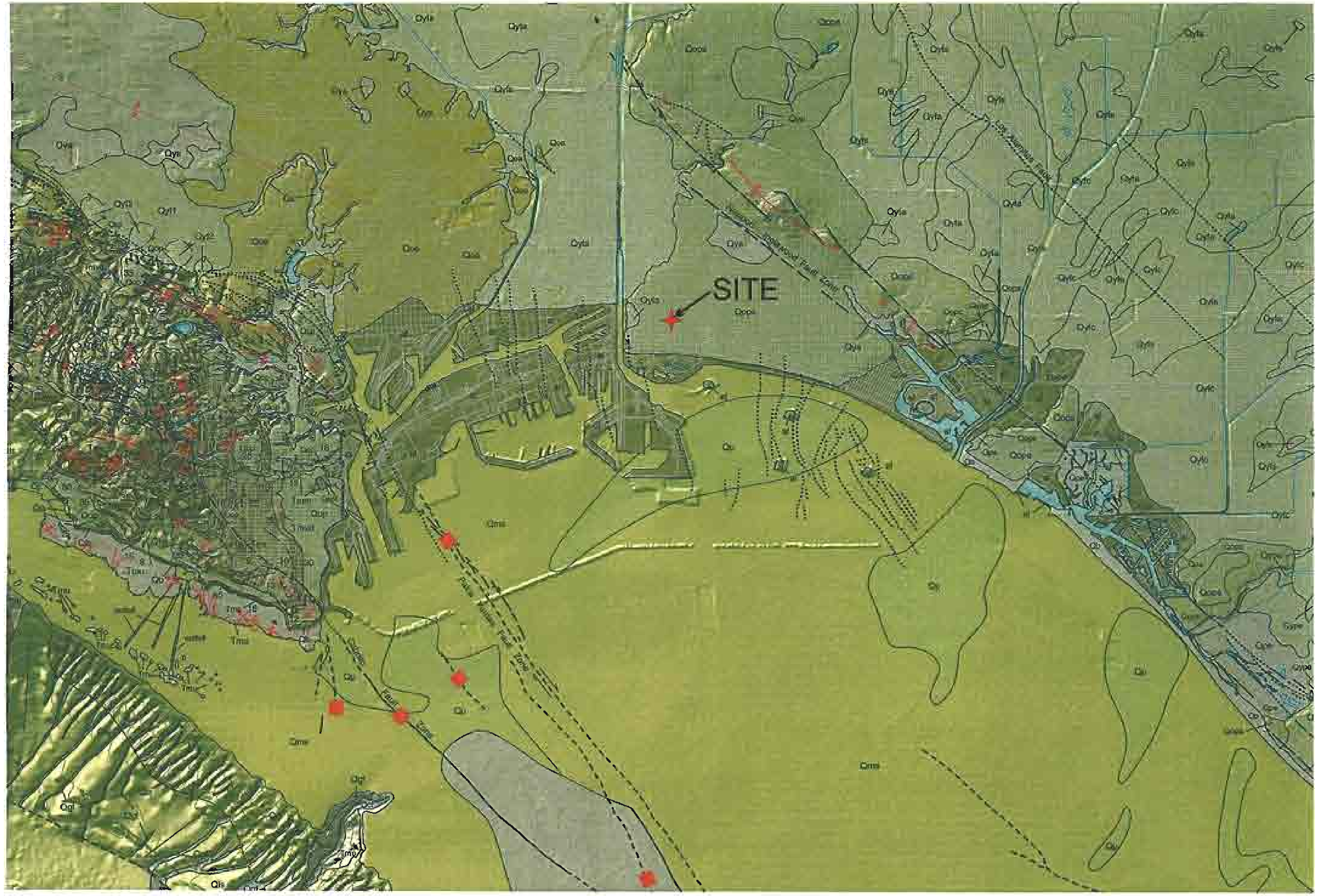
Anticlinal fold - solid where well located; dashed where approximately located or inferred; dotted where concealed. Plunge direction indicated by arrowhead on fold axis.

Synclinal fold - solid where well located; dashed where approximately located or inferred; dotted where concealed. Plunge direction indicated by arrowhead on fold axis.

Strike and dip of stratified rocks. Number indicates dip angle in degrees when known.

25 Inclined beds

80 Overturned beds



Base: California Geological Survey, 2003,
Geologic Map of the Long Beach 30'x 60'
Quadrangle, California, Map No. 5

SCALE 1:100,000

1 .5 0 1 2 3 4 5 6 7 MILES

1 .5 0 1 2 3 4 5 6 7 KILOMETERS

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 THOUSAND FEET

CONTOUR INTERVAL 40 METERS
BATHYMETRIC CONTOUR INTERVAL 100 METERS

DRAFT

N

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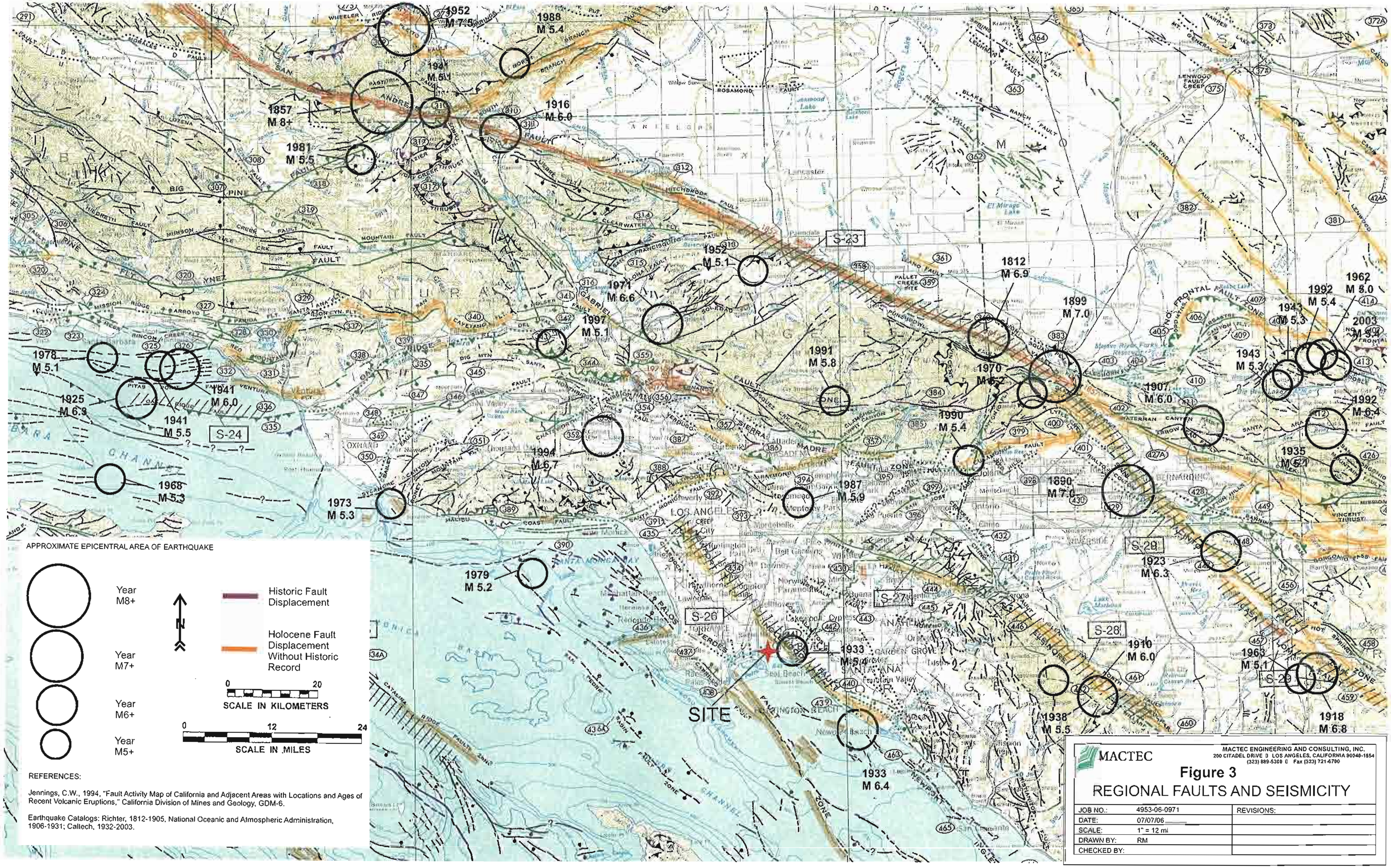
200 CITADEL DRIVE ◊ LOS ANGELES, CALIFORNIA 90040
(323) 889-5300 ◊ fax (323) 889-5398

Figure 2 Geologic Map
Press-Telegram
Mixed Use Development

JOB NO.: 4953-06-0971	REVISIONS:
DATE: 7/7/06	
SCALE:	
DRAWN BY: RM	
CHECKED BY:	



REFERENCES:

Jennings, C.W., 1994, "Fault Activity Map of California and Adjacent Areas with Locations and Ages of Recent Volcanic Eruptions," California Division of Mines and Geology, GDM-6.

Earthquake Catalogs: Richter, 1812-1905, National Oceanic and Atmospheric Administration, 1906-1931; Caltech, 1932-2003.

MACTEC

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200 CITADEL DRIVE ▯ LOS ANGELES, CALIFORNIA 90040-1554
(323) 889-5300 ▯ Fax (323) 721-6700

Figure 3

REGIONAL FAULTS AND SEISMICITY

JOB NO.:	4953-06-0971	REVISIONS:
DATE:	07/07/06	
SCALE:	1" = 12 mi	
DRAWN BY:	RM	
CHECKED BY:		

DRAFT

APPENDIX

EARTHQUAKE DATABASE

Table 3
List Of Historic Earthquakes Of Magnitude 4.0 Or Greater Within 100 Km Of The Site
(CAL TECH DATA 1932-2006)

DATE	TIME	LATITUDE	LONGITUDE	Q	DIST	DEPTH	MAGNITUDE
11-01-1932	04:45:00	34.00 N	117.25 W	E	91	.0	4.0
03-11-1933	01:54:07	33.62 N	117.97 W	A	27	.0	6.4
03-11-1933	02:04:00	33.75 N	118.08 W	C	10	.0	4.9
03-11-1933	02:05:00	33.75 N	118.08 W	C	10	.0	4.3
03-11-1933	02:09:00	33.75 N	118.08 W	C	10	.0	5.0
03-11-1933	02:10:00	33.75 N	118.08 W	C	10	.0	4.6
03-11-1933	02:11:00	33.75 N	118.08 W	C	10	.0	4.4
03-11-1933	02:16:00	33.75 N	118.08 W	C	10	.0	4.8
03-11-1933	02:17:00	33.60 N	118.00 W	E	26	.0	4.5
03-11-1933	02:22:00	33.75 N	118.08 W	C	10	.0	4.0
03-11-1933	02:27:00	33.75 N	118.08 W	C	10	.0	4.6
03-11-1933	02:30:00	33.75 N	118.08 W	C	10	.0	5.1
03-11-1933	02:31:00	33.60 N	118.00 W	E	26	.0	4.4
03-11-1933	02:52:00	33.75 N	118.08 W	C	10	.0	4.0
03-11-1933	02:57:00	33.75 N	118.08 W	C	10	.0	4.2
03-11-1933	02:58:00	33.75 N	118.08 W	C	10	.0	4.0
03-11-1933	02:59:00	33.75 N	118.08 W	C	10	.0	4.6
03-11-1933	03:05:00	33.75 N	118.08 W	C	10	.0	4.2
03-11-1933	03:09:00	33.75 N	118.08 W	C	10	.0	4.4
03-11-1933	03:11:00	33.75 N	118.08 W	C	10	.0	4.2
03-11-1933	03:23:00	33.75 N	118.08 W	C	10	.0	5.0
03-11-1933	03:36:00	33.75 N	118.08 W	C	10	.0	4.0
03-11-1933	03:39:00	33.75 N	118.08 W	C	10	.0	4.0
03-11-1933	03:47:00	33.75 N	118.08 W	C	10	.0	4.1
03-11-1933	04:36:00	33.75 N	118.08 W	C	10	.0	4.6
03-11-1933	04:39:00	33.75 N	118.08 W	C	10	.0	4.9
03-11-1933	04:40:00	33.75 N	118.08 W	C	10	.0	4.7
03-11-1933	05:10:22	33.70 N	118.07 W	C	14	.0	5.1
03-11-1933	05:13:00	33.75 N	118.08 W	C	10	.0	4.7
03-11-1933	05:15:00	33.75 N	118.08 W	C	10	.0	4.0
03-11-1933	05:18:04	33.58 N	117.98 W	C	29	.0	5.2
03-11-1933	05:21:00	33.75 N	118.08 W	C	10	.0	4.4
03-11-1933	05:24:00	33.75 N	118.08 W	C	10	.0	4.2
03-11-1933	05:53:00	33.75 N	118.08 W	C	10	.0	4.0
03-11-1933	05:55:00	33.75 N	118.08 W	C	10	.0	4.0

NOTE: Q IS A FACTOR RELATING THE QUALITY OF EPICENTRAL DETERMINATION

A = +- 1 km horizontal distance; +- 2 km depth
B = +- 2 km horizontal distance; +- 5 km depth
C = +- 5 km horizontal distance; no depth restriction
D = >+- 5 km horizontal distance

Event qualities are highly suspect prior to 1990. Many of these event qualities are based on incomplete information according to Caltech.

Table 3
List Of Historic Earthquakes Of Magnitude 4.0 Or Greater Within 100 Km Of The Site
(CAL TECH DATA 1932-2006)

DATE	TIME	LATITUDE	LONGITUDE	Q	DIST	DEPTH	MAGNITUDE
03-11-1933	06:11:00	33.75 N	118.08 W	C	10	.0	4.4
03-11-1933	06:18:00	33.75 N	118.08 W	C	10	.0	4.2
03-11-1933	06:29:00	33.85 N	118.27 W	C	11	.0	4.4
03-11-1933	06:35:00	33.75 N	118.08 W	C	10	.0	4.2
03-11-1933	06:58:03	33.68 N	118.05 W	C	17	.0	5.5
03-11-1933	07:51:00	33.75 N	118.08 W	C	10	.0	4.2
03-11-1933	07:59:00	33.75 N	118.08 W	C	10	.0	4.1
03-11-1933	08:08:00	33.75 N	118.08 W	C	10	.0	4.5
03-11-1933	08:32:00	33.75 N	118.08 W	C	10	.0	4.2
03-11-1933	08:37:00	33.75 N	118.08 W	C	10	.0	4.0
03-11-1933	08:54:57	33.70 N	118.07 W	C	14	.0	5.1
03-11-1933	09:10:00	33.75 N	118.08 W	C	10	.0	5.1
03-11-1933	09:11:00	33.75 N	118.08 W	C	10	.0	4.4
03-11-1933	09:26:00	33.75 N	118.08 W	C	10	.0	4.1
03-11-1933	10:25:00	33.75 N	118.08 W	C	10	.0	4.0
03-11-1933	10:45:00	33.75 N	118.08 W	C	10	.0	4.0
03-11-1933	11:00:00	33.75 N	118.08 W	C	10	.0	4.0
03-11-1933	11:04:00	33.75 N	118.13 W	C	6	.0	4.6
03-11-1933	11:29:00	33.75 N	118.08 W	C	10	.0	4.0
03-11-1933	11:38:00	33.75 N	118.08 W	C	10	.0	4.0
03-11-1933	11:41:00	33.75 N	118.08 W	C	10	.0	4.2
03-11-1933	11:47:00	33.75 N	118.08 W	C	10	.0	4.4
03-11-1933	12:50:00	33.68 N	118.05 W	C	17	.0	4.4
03-11-1933	13:50:00	33.73 N	118.10 W	C	10	.0	4.4
03-11-1933	13:57:00	33.75 N	118.08 W	C	10	.0	4.0
03-11-1933	14:25:00	33.85 N	118.27 W	C	11	.0	5.0
03-11-1933	14:47:00	33.73 N	118.10 W	C	10	.0	4.4
03-11-1933	14:57:00	33.88 N	118.32 W	C	17	.0	4.9
03-11-1933	15:09:00	33.73 N	118.10 W	C	10	.0	4.4
03-11-1933	15:47:00	33.75 N	118.08 W	C	10	.0	4.0
03-11-1933	16:53:00	33.75 N	118.08 W	C	10	.0	4.8
03-11-1933	19:44:00	33.75 N	118.08 W	C	10	.0	4.0
03-11-1933	19:56:00	33.75 N	118.08 W	C	10	.0	4.2
03-11-1933	22:00:00	33.75 N	118.08 W	C	10	.0	4.4
03-11-1933	22:31:00	33.75 N	118.08 W	C	10	.0	4.4

NOTE: Q IS A FACTOR RELATING THE QUALITY OF EPICENTRAL DETERMINATION

A = +- 1 km horizontal distance; +- 2 km depth
B = +- 2 km horizontal distance; +- 5 km depth
C = +- 5 km horizontal distance; no depth restriction
D = >+- 5 km horizontal distance

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(CAL TECH DATA 1932-2006)

DATE	TIME	LATITUDE	LONGITUDE	Q	DIST	DEPTH	MAGNITUDE
03-11-1933	22:32:00	33.75 N	118.08 W	C	10	.0	4.1
03-11-1933	22:40:00	33.75 N	118.08 W	C	10	.0	4.4
03-11-1933	23:05:00	33.75 N	118.08 W	C	10	.0	4.2
03-12-1933	00:27:00	33.75 N	118.08 W	C	10	.0	4.4
03-12-1933	00:34:00	33.75 N	118.08 W	C	10	.0	4.0
03-12-1933	04:48:00	33.75 N	118.08 W	C	10	.0	4.0
03-12-1933	05:46:00	33.75 N	118.08 W	C	10	.0	4.4
03-12-1933	06:01:00	33.75 N	118.08 W	C	10	.0	4.2
03-12-1933	06:16:00	33.75 N	118.08 W	C	10	.0	4.6
03-12-1933	07:40:00	33.75 N	118.08 W	C	10	.0	4.2
03-12-1933	08:35:00	33.75 N	118.08 W	C	10	.0	4.2
03-12-1933	15:02:00	33.75 N	118.08 W	C	10	.0	4.2
03-12-1933	16:51:00	33.75 N	118.08 W	C	10	.0	4.0
03-12-1933	17:38:00	33.75 N	118.08 W	C	10	.0	4.5
03-12-1933	18:25:00	33.75 N	118.08 W	C	10	.0	4.1
03-12-1933	21:28:00	33.75 N	118.08 W	C	10	.0	4.1
03-12-1933	23:54:00	33.75 N	118.08 W	C	10	.0	4.5
03-13-1933	03:43:00	33.75 N	118.08 W	C	10	.0	4.1
03-13-1933	04:32:00	33.75 N	118.08 W	C	10	.0	4.7
03-13-1933	06:17:00	33.75 N	118.08 W	C	10	.0	4.0
03-13-1933	13:18:28	33.75 N	118.08 W	C	10	.0	5.3
03-13-1933	15:32:00	33.75 N	118.08 W	C	10	.0	4.1
03-13-1933	19:29:00	33.75 N	118.08 W	C	10	.0	4.2
03-14-1933	00:36:00	33.75 N	118.08 W	C	10	.0	4.2
03-14-1933	12:19:00	33.75 N	118.08 W	C	10	.0	4.5
03-14-1933	19:01:50	33.62 N	118.02 W	C	24	.0	5.1
03-14-1933	22:42:00	33.75 N	118.08 W	C	10	.0	4.1
03-15-1933	02:08:00	33.75 N	118.08 W	C	10	.0	4.1
03-15-1933	04:32:00	33.75 N	118.08 W	C	10	.0	4.1
03-15-1933	05:40:00	33.75 N	118.08 W	C	10	.0	4.2
03-15-1933	11:13:32	33.62 N	118.02 W	C	24	.0	4.9
03-16-1933	14:56:00	33.75 N	118.08 W	C	10	.0	4.0
03-16-1933	15:29:00	33.75 N	118.08 W	C	10	.0	4.2
03-16-1933	15:30:00	33.75 N	118.08 W	C	10	.0	4.1
03-17-1933	16:51:00	33.75 N	118.08 W	C	10	.0	4.1

NOTE: Q IS A FACTOR RELATING THE QUALITY OF EPICENTRAL DETERMINATION

A = +- 1 km horizontal distance; +- 2 km depth
B = +- 2 km horizontal distance; +- 5 km depth
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D = >+- 5 km horizontal distance

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(CAL TECH DATA 1932-2006)

DATE	TIME	LATITUDE	LONGITUDE	Q	DIST	DEPTH	MAGNITUDE
03-18-1933	20:52:00	33.75 N	118.08 W	C	10	.0	4.2
03-19-1933	21:23:00	33.75 N	118.08 W	C	10	.0	4.2
03-20-1933	13:58:00	33.75 N	118.08 W	C	10	.0	4.1
03-21-1933	03:26:00	33.75 N	118.08 W	C	10	.0	4.1
03-23-1933	08:40:00	33.75 N	118.08 W	C	10	.0	4.1
03-23-1933	18:31:00	33.75 N	118.08 W	C	10	.0	4.1
03-25-1933	13:46:00	33.75 N	118.08 W	C	10	.0	4.1
03-30-1933	12:25:00	33.75 N	118.08 W	C	10	.0	4.4
03-31-1933	10:49:00	33.75 N	118.08 W	C	10	.0	4.1
04-01-1933	06:42:00	33.75 N	118.08 W	C	10	.0	4.2
04-02-1933	08:00:00	33.75 N	118.08 W	C	10	.0	4.0
04-02-1933	15:36:00	33.75 N	118.08 W	C	10	.0	4.0
05-16-1933	20:58:55	33.75 N	118.17 W	C	4	.0	4.0
08-04-1933	04:17:48	33.75 N	118.18 W	C	3	.0	4.0
10-02-1933	09:10:17	33.78 N	118.13 W	A	5	.0	5.4
10-02-1933	13:26:01	33.62 N	118.02 W	C	24	.0	4.0
10-25-1933	07:00:46	33.95 N	118.13 W	C	20	.0	4.3
11-13-1933	21:28:00	33.87 N	118.20 W	C	10	.0	4.0
11-20-1933	10:32:00	33.78 N	118.13 W	B	5	.0	4.0
01-09-1934	14:10:00	34.10 N	117.68 W	A	59	.0	4.5
01-18-1934	02:14:00	34.10 N	117.68 W	A	59	.0	4.0
01-20-1934	21:17:00	33.62 N	118.12 W	B	19	.0	4.5
04-17-1934	18:33:00	33.57 N	117.98 W	C	30	.0	4.0
10-17-1934	09:38:00	33.63 N	118.40 W	B	25	.0	4.0
11-16-1934	21:26:00	33.75 N	118.00 W	B	18	.0	4.0
06-19-1935	11:17:00	33.72 N	117.52 W	B	63	.0	4.0
07-13-1935	10:54:16	34.20 N	117.90 W	A	54	.0	4.7
09-03-1935	06:47:00	34.03 N	117.32 W	B	86	.0	4.5
12-25-1935	17:15:00	33.60 N	118.02 W	B	25	.0	4.5
02-23-1936	22:20:42	34.13 N	117.34 W	A	88	10.0	4.5
02-26-1936	09:33:27	34.14 N	117.34 W	A	89	10.0	4.0
08-22-1936	05:21:00	33.77 N	117.82 W	B	35	.0	4.0
10-29-1936	22:35:36	34.38 N	118.62 W	C	78	10.0	4.0
01-15-1937	18:35:47	33.56 N	118.06 W	B	27	10.0	4.0
03-19-1937	01:23:38	34.11 N	117.43 W	A	80	10.0	4.0

NOTE: Q IS A FACTOR RELATING THE QUALITY OF EPICENTRAL DETERMINATION

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Table 3
List Of Historic Earthquakes Of Magnitude 4.0 Or Greater Within 100 Km Of The Site
(CAL TECH DATA 1932-2006)

DATE	TIME	LATITUDE	LONGITUDE	Q	DIST	DEPTH	MAGNITUDE
07-07-1937	11:12:00	33.57 N	117.98 W	B	30	.0	4.0
09-01-1937	13:48:08	34.21 N	117.53 W	A	78	10.0	4.5
09-01-1937	16:35:33	34.18 N	117.55 W	A	75	10.0	4.5
09-13-1937	22:14:39	33.04 N	118.73 W	C	96	10.0	4.0
05-21-1938	09:44:00	33.62 N	118.03 W	B	23	.0	4.0
05-31-1938	08:34:55	33.70 N	117.51 W	B	64	10.0	5.2
07-05-1938	18:06:55	33.68 N	117.55 W	A	60	10.0	4.5
08-06-1938	22:00:55	33.72 N	117.51 W	B	64	10.0	4.0
08-31-1938	03:18:14	33.76 N	118.25 W	A	6	10.0	4.5
11-29-1938	19:21:15	33.90 N	118.43 W	A	26	10.0	4.0
12-07-1938	03:38:00	34.00 N	118.42 W	B	33	.0	4.0
12-27-1938	10:09:28	34.13 N	117.52 W	B	73	10.0	4.0
04-03-1939	02:50:44	34.04 N	117.23 W	A	94	10.0	4.0
11-04-1939	21:41:00	33.77 N	118.12 W	B	7	.0	4.0
11-07-1939	18:52:08	34.00 N	117.28 W	A	88	.0	4.7
12-27-1939	19:28:49	33.78 N	118.20 W	A	1	.0	4.7
01-13-1940	07:49:07	33.78 N	118.13 W	B	5	.0	4.0
02-08-1940	16:56:17	33.70 N	118.07 W	B	14	.0	4.0
02-11-1940	19:24:10	33.98 N	118.30 W	B	25	.0	4.0
04-18-1940	18:43:43	34.03 N	117.35 W	A	83	.0	4.4
06-05-1940	08:27:27	33.83 N	117.40 W	B	74	.0	4.0
07-20-1940	04:01:13	33.70 N	118.07 W	B	14	.0	4.0
10-11-1940	05:57:12	33.77 N	118.45 W	A	24	.0	4.7
10-12-1940	00:24:00	33.78 N	118.42 W	B	21	.0	4.0
10-14-1940	20:51:11	33.78 N	118.42 W	B	21	.0	4.0
11-01-1940	07:25:03	33.78 N	118.42 W	B	21	.0	4.0
11-01-1940	20:00:46	33.63 N	118.20 W	B	16	.0	4.0
11-02-1940	02:58:26	33.78 N	118.42 W	B	21	.0	4.0
01-30-1941	01:34:46	33.97 N	118.05 W	A	25	.0	4.1
03-22-1941	08:22:40	33.52 N	118.10 W	B	30	.0	4.0
03-25-1941	23:43:41	34.22 N	117.47 W	B	83	.0	4.0
04-11-1941	01:20:24	33.95 N	117.58 W	B	60	.0	4.0
10-22-1941	06:57:18	33.82 N	118.22 W	A	5	.0	4.8
11-14-1941	08:41:36	33.78 N	118.25 W	A	5	.0	4.8
04-16-1942	07:28:33	33.37 N	118.15 W	C	45	.0	4.0

NOTE: Q IS A FACTOR RELATING THE QUALITY OF EPICENTRAL DETERMINATION

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Event qualities are highly suspect prior to 1990. Many of these event qualities are based on incomplete information according to Caltech.

Table 3
List Of Historic Earthquakes Of Magnitude 4.0 Or Greater Within 100 Km Of The Site
(CAL TECH DATA 1932-2006)

DATE	TIME	LATITUDE		LONGITUDE		Q	DIST	DEPTH	MAGNITUDE
10-24-1943	00:29:21	33.93	N	117.37	W	C	78	.0	4.0
06-19-1944	00:03:33	33.87	N	118.22	W	B	10	.0	4.5
06-19-1944	03:06:07	33.87	N	118.22	W	C	10	.0	4.4
02-24-1946	06:07:52	34.40	N	117.80	W	C	78	.0	4.1
06-01-1946	11:06:31	34.42	N	118.83	W	C	93	.0	4.1
03-01-1948	08:12:13	34.17	N	117.53	W	B	75	.0	4.7
04-16-1948	22:26:24	34.02	N	118.97	W	B	77	.0	4.7
10-03-1948	02:46:28	34.18	N	117.58	W	A	72	.0	4.0
01-11-1950	21:41:35	33.94	N	118.20	W	A	18	.4	4.1
09-22-1951	08:22:39	34.12	N	117.34	W	A	88	11.9	4.3
02-10-1952	13:50:55	33.58	N	119.18	W	C	94	.0	4.0
02-17-1952	12:36:58	34.00	N	117.27	W	A	89	16.0	4.5
08-23-1952	10:09:07	34.52	N	118.20	W	A	83	13.1	5.1
10-26-1954	16:22:26	33.73	N	117.47	W	B	67	.0	4.1
05-15-1955	17:03:25	34.12	N	117.48	W	A	76	7.6	4.0
05-29-1955	16:43:35	33.99	N	119.06	W	B	84	17.4	4.1
01-03-1956	00:25:48	33.72	N	117.50	W	B	64	13.7	4.7
02-07-1956	02:16:56	34.53	N	118.64	W	B	94	16.0	4.2
02-07-1956	03:16:38	34.59	N	118.61	W	A	98	2.6	4.6
03-25-1956	03:32:02	33.60	N	119.11	W	A	87	8.2	4.2
06-28-1960	20:00:48	34.12	N	117.47	W	A	76	12.0	4.1
10-04-1961	02:21:31	33.85	N	117.75	W	B	42	4.3	4.1
10-20-1961	19:49:50	33.65	N	117.99	W	B	23	4.6	4.3
10-20-1961	20:07:14	33.66	N	117.98	W	B	23	6.1	4.0
10-20-1961	21:42:40	33.67	N	117.98	W	B	23	7.2	4.0
10-20-1961	22:35:34	33.67	N	118.01	W	B	20	5.6	4.1
11-20-1961	08:53:34	33.68	N	117.99	W	B	21	4.4	4.0
04-27-1962	09:12:32	33.74	N	117.19	W	B	93	5.7	4.1
09-14-1963	03:51:16	33.54	N	118.34	W	B	29	2.2	4.2
08-30-1964	22:57:37	34.27	N	118.44	W	B	60	15.4	4.0
01-01-1965	08:04:18	34.14	N	117.52	W	B	75	5.9	4.4
04-15-1965	20:08:33	34.13	N	117.43	W	B	81	5.5	4.5
07-16-1965	07:46:22	34.49	N	118.52	W	B	84	15.1	4.0
01-08-1967	07:37:30	33.63	N	118.47	W	B	30	11.4	4.0
01-08-1967	07:38:05	33.66	N	118.41	W	C	24	17.7	4.0

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Table 3
List Of Historic Earthquakes Of Magnitude 4.0 Or Greater Within 100 Km Of The Site
(CAL TECH DATA 1932-2006)

DATE	TIME	LATITUDE	LONGITUDE	Q	DIST	DEPTH	MAGNITUDE
06-15-1967	04:58:05	34.00 N	117.97 W	B	32	10.0	4.1
02-28-1969	04:56:12	34.57 N	118.11 W	A	88	5.3	4.3
05-05-1969	16:02:09	34.30 N	117.57 W	B	82	8.8	4.4
10-24-1969	20:26:42	33.34 N	119.10 W	B	97	-1.8	4.7
10-27-1969	13:16:02	33.55 N	117.81 W	B	44	6.5	4.5
10-31-1969	10:39:28	33.43 N	119.10 W	B	92	7.3	4.7
09-12-1970	14:10:11	34.27 N	117.52 W	A	83	8.0	4.1
09-12-1970	14:30:52	34.27 N	117.54 W	A	82	8.0	5.2
09-13-1970	04:47:48	34.28 N	117.55 W	A	82	8.0	4.4
02-09-1971	14:00:41	34.41 N	118.40 W	B	73	8.4	6.6
02-09-1971	14:01:08	34.41 N	118.40 W	D	73	8.0	5.8
02-09-1971	14:01:33	34.41 N	118.40 W	D	73	8.0	4.2
02-09-1971	14:01:40	34.41 N	118.40 W	D	73	8.0	4.1
02-09-1971	14:01:50	34.41 N	118.40 W	D	73	8.0	4.5
02-09-1971	14:01:54	34.41 N	118.40 W	D	73	8.0	4.2
02-09-1971	14:01:59	34.41 N	118.40 W	D	73	8.0	4.1
02-09-1971	14:02:03	34.41 N	118.40 W	D	73	8.0	4.1
02-09-1971	14:02:30	34.41 N	118.40 W	D	73	8.0	4.3
02-09-1971	14:02:31	34.41 N	118.40 W	D	73	8.0	4.7
02-09-1971	14:02:44	34.41 N	118.40 W	D	73	8.0	5.8
02-09-1971	14:03:25	34.41 N	118.40 W	D	73	8.0	4.4
02-09-1971	14:03:46	34.41 N	118.40 W	D	73	8.0	4.1
02-09-1971	14:04:07	34.41 N	118.40 W	D	73	8.0	4.1
02-09-1971	14:04:34	34.41 N	118.40 W	C	73	8.0	4.2
02-09-1971	14:04:39	34.41 N	118.40 W	D	73	8.0	4.1
02-09-1971	14:04:44	34.41 N	118.40 W	D	73	8.0	4.1
02-09-1971	14:04:46	34.41 N	118.40 W	D	73	8.0	4.2
02-09-1971	14:05:41	34.41 N	118.40 W	D	73	8.0	4.1
02-09-1971	14:05:50	34.41 N	118.40 W	D	73	8.0	4.1
02-09-1971	14:07:10	34.41 N	118.40 W	D	73	8.0	4.0
02-09-1971	14:07:30	34.41 N	118.40 W	D	73	8.0	4.0
02-09-1971	14:07:45	34.41 N	118.40 W	D	73	8.0	4.5
02-09-1971	14:08:04	34.41 N	118.40 W	D	73	8.0	4.0
02-09-1971	14:08:07	34.41 N	118.40 W	D	73	8.0	4.2
02-09-1971	14:08:38	34.41 N	118.40 W	D	73	8.0	4.5

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(CAL TECH DATA 1932-2006)

DATE	TIME	LATITUDE	LONGITUDE	Q	DIST	DEPTH	MAGNITUDE
02-09-1971	14:08:53	34.41 N	118.40 W	D	73	8.0	4.6
02-09-1971	14:10:21	34.36 N	118.31 W	B	66	5.0	4.7
02-09-1971	14:10:28	34.41 N	118.40 W	D	73	8.0	5.3
02-09-1971	14:16:12	34.34 N	118.33 W	C	64	11.1	4.1
02-09-1971	14:19:50	34.36 N	118.41 W	B	68	11.8	4.0
02-09-1971	14:34:36	34.34 N	118.64 W	C	75	-2.0	4.9
02-09-1971	14:39:17	34.39 N	118.36 W	C	70	-1.6	4.0
02-09-1971	14:40:17	34.43 N	118.40 W	C	76	-2.0	4.1
02-09-1971	14:43:46	34.31 N	118.45 W	B	64	6.2	5.2
02-09-1971	15:58:20	34.33 N	118.33 W	B	63	14.2	4.8
02-09-1971	16:19:26	34.46 N	118.43 W	B	79	-1.0	4.2
02-10-1971	03:12:12	34.37 N	118.30 W	B	67	.8	4.0
02-10-1971	05:06:36	34.41 N	118.33 W	A	72	4.7	4.3
02-10-1971	05:18:07	34.43 N	118.41 W	A	75	5.8	4.5
02-10-1971	11:31:34	34.38 N	118.46 W	A	72	6.0	4.2
02-10-1971	13:49:53	34.40 N	118.42 W	A	72	9.7	4.3
02-10-1971	14:35:26	34.36 N	118.49 W	A	71	4.4	4.2
02-10-1971	17:38:55	34.40 N	118.37 W	A	71	6.2	4.2
02-10-1971	18:54:41	34.45 N	118.44 W	A	78	8.1	4.2
02-21-1971	05:50:52	34.40 N	118.44 W	A	73	6.9	4.7
02-21-1971	07:15:11	34.39 N	118.43 W	A	72	7.2	4.5
03-07-1971	01:33:40	34.35 N	118.46 W	A	69	3.3	4.5
03-25-1971	22:54:09	34.36 N	118.47 W	A	70	4.6	4.2
03-30-1971	08:54:43	34.30 N	118.46 W	A	63	2.6	4.1
03-31-1971	14:52:22	34.29 N	118.51 W	A	64	2.1	4.6
04-01-1971	15:03:03	34.43 N	118.41 W	A	75	8.0	4.1
04-02-1971	05:40:25	34.28 N	118.53 W	A	64	3.0	4.0
04-15-1971	11:14:32	34.26 N	118.58 W	B	65	4.2	4.2
04-25-1971	14:48:06	34.37 N	118.31 W	B	67	-2.0	4.0
06-21-1971	16:01:08	34.27 N	118.53 W	B	64	4.1	4.0
06-22-1971	10:41:19	33.75 N	117.48 W	B	66	8.0	4.2
02-21-1973	14:45:57	34.06 N	119.04 W	B	84	8.0	5.3
03-09-1974	00:54:31	34.40 N	118.47 W	C	74	24.4	4.7
08-14-1974	14:45:55	34.43 N	118.37 W	A	75	8.2	4.2
01-01-1976	17:20:12	33.97 N	117.89 W	A	35	6.2	4.2

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DATE	TIME	LATITUDE	LONGITUDE	Q	DIST	DEPTH	MAGNITUDE
04-08-1976	15:21:38	34.35 N	118.66 W	A	77	14.5	4.6
08-12-1977	02:19:26	34.38 N	118.46 W	B	72	9.5	4.5
09-24-1977	21:28:24	34.46 N	118.41 W	C	79	5.0	4.2
05-23-1978	09:16:50	33.91 N	119.17 W	C	91	6.0	4.0
01-01-1979	23:14:38	33.94 N	118.68 W	B	49	11.3	5.2
10-17-1979	20:52:37	33.93 N	118.67 W	C	48	5.5	4.2
10-19-1979	12:22:37	34.21 N	117.53 W	B	78	4.9	4.1
09-04-1981	15:50:50	33.65 N	119.09 W	C	85	6.0	5.5
10-23-1981	17:28:17	33.64 N	119.01 W	C	77	6.0	4.6
10-23-1981	19:15:52	33.62 N	119.02 W	A	78	14.8	4.6
04-13-1982	11:02:12	34.06 N	118.97 W	A	79	12.1	4.0
05-25-1982	13:44:30	33.55 N	118.21 W	A	25	12.6	4.3
01-08-1983	07:19:30	34.13 N	117.45 W	A	79	7.8	4.1
02-22-1983	02:18:30	33.03 N	117.94 W	D	85	10.0	4.3
02-27-1984	10:18:15	33.47 N	118.06 W	C	36	6.0	4.0
09-07-1984	11:03:13	32.94 N	117.81 W	C	99	6.0	4.3
10-26-1984	17:20:43	34.02 N	118.99 W	A	79	13.3	4.6
10-02-1985	23:44:12	34.02 N	117.25 W	A	92	15.2	4.8
07-13-1986	13:47:08	32.97 N	117.87 W	C	94	6.0	5.4
07-13-1986	14:01:33	32.99 N	117.84 W	C	93	6.0	4.3
07-14-1986	00:32:46	32.96 N	117.82 W	C	96	6.0	4.1
07-29-1986	08:17:41	32.93 N	117.84 W	C	99	6.0	4.3
07-30-1986	22:51:13	32.99 N	117.80 W	C	95	6.0	4.0
07-31-1986	01:06:19	32.97 N	117.83 W	C	95	6.0	4.1
09-30-1986	09:52:11	32.99 N	117.80 W	C	94	6.0	4.1
02-21-1987	23:15:29	34.13 N	117.45 W	A	80	8.5	4.0
10-01-1987	14:42:20	34.06 N	118.08 W	A	33	9.5	5.9
10-01-1987	14:45:41	34.05 N	118.10 W	A	32	13.6	4.7
10-01-1987	14:48:03	34.08 N	118.09 W	A	35	11.7	4.1
10-01-1987	14:49:05	34.06 N	118.10 W	A	33	11.7	4.7
10-01-1987	15:12:31	34.05 N	118.09 W	A	32	10.8	4.7
10-01-1987	15:59:53	34.05 N	118.09 W	A	32	10.4	4.0
10-04-1987	10:59:38	34.07 N	118.10 W	A	34	8.3	5.3
10-24-1987	23:58:33	33.68 N	119.06 W	A	81	12.2	4.1
02-11-1988	15:25:55	34.08 N	118.05 W	A	36	12.5	4.7

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DATE	TIME	LATITUDE		LONGITUDE		Q	DIST	DEPTH	MAGNITUDE
06-26-1988	15:04:58	34.14	N	117.71	W	A	60	7.9	4.7
11-20-1988	05:39:28	33.51	N	118.07	W	C	32	6.0	4.9
12-03-1988	11:38:26	34.15	N	118.13	W	A	42	14.3	5.0
01-19-1989	06:53:28	33.92	N	118.63	W	A	43	11.9	5.0
02-18-1989	07:17:04	34.01	N	117.74	W	A	49	3.3	4.1
04-07-1989	20:07:30	33.62	N	117.90	W	A	32	12.9	4.7
06-12-1989	16:57:18	34.03	N	118.18	W	A	28	15.6	4.6
06-12-1989	17:22:25	34.02	N	118.18	W	A	27	15.5	4.4
12-28-1989	09:41:08	34.19	N	117.39	W	A	88	14.6	4.3
02-28-1990	23:43:36	34.14	N	117.70	W	A	61	4.5	5.4
03-01-1990	00:34:57	34.13	N	117.70	W	A	60	4.4	4.0
03-01-1990	03:23:03	34.15	N	117.72	W	A	61	11.4	4.7
03-02-1990	17:26:25	34.15	N	117.69	W	A	62	5.6	4.7
04-04-1990	08:54:39	32.97	N	117.81	W	C	96	6.0	4.3
04-17-1990	22:32:27	34.11	N	117.72	W	A	57	3.6	4.8
06-28-1991	14:43:54	34.27	N	117.99	W	A	58	9.1	5.8
06-28-1991	17:00:55	34.25	N	117.99	W	A	56	9.5	4.3
07-05-1991	17:41:57	34.50	N	118.56	W	A	87	10.9	4.1
01-17-1994	12:30:55	34.21	N	118.54	W	A	58	18.4	6.7
01-17-1994	12:30:55	34.22	N	118.54	W	A	58	17.4	6.6
01-17-1994	12:31:58	34.27	N	118.49	W	C	62	6.0	5.9
01-17-1994	12:34:18	34.31	N	118.47	W	C	65	6.0	4.4
01-17-1994	12:39:39	34.26	N	118.54	W	C	63	6.0	4.9
01-17-1994	12:40:09	34.32	N	118.51	W	C	67	6.0	4.8
01-17-1994	12:40:36	34.34	N	118.61	W	C	74	6.0	5.2
01-17-1994	12:54:33	34.31	N	118.46	W	C	64	6.0	4.0
01-17-1994	12:55:46	34.28	N	118.58	W	C	66	6.0	4.1
01-17-1994	13:06:28	34.25	N	118.55	W	C	62	6.0	4.6
01-17-1994	13:26:45	34.32	N	118.46	W	C	65	6.0	4.7
01-17-1994	13:28:13	34.27	N	118.58	W	C	65	6.0	4.0
01-17-1994	13:56:02	34.29	N	118.62	W	C	70	6.0	4.4
01-17-1994	14:14:30	34.33	N	118.44	W	C	66	6.0	4.5
01-17-1994	15:07:03	34.30	N	118.47	W	A	64	2.6	4.2
01-17-1994	15:07:35	34.31	N	118.47	W	A	64	1.6	4.1
01-17-1994	15:54:10	34.38	N	118.63	W	A	78	13.0	4.8

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DATE	TIME	LATITUDE	LONGITUDE	Q	DIST	DEPTH	MAGNITUDE
01-17-1994	17:56:08	34.23 N	118.57 W	A	61	19.2	4.6
01-17-1994	19:35:34	34.31 N	118.46 W	A	64	2.3	4.0
01-17-1994	19:43:53	34.37 N	118.64 W	A	78	13.9	4.1
01-17-1994	20:46:02	34.30 N	118.57 W	C	68	6.0	4.9
01-17-1994	22:31:53	34.34 N	118.44 W	C	67	6.0	4.1
01-17-1994	23:33:30	34.33 N	118.70 W	A	77	9.8	5.6
01-17-1994	23:49:25	34.34 N	118.67 W	A	77	8.4	4.0
01-18-1994	00:39:35	34.38 N	118.56 W	A	75	7.2	4.4
01-18-1994	00:40:04	34.39 N	118.54 W	A	76	.0	4.2
01-18-1994	00:43:08	34.38 N	118.70 W	A	82	11.3	5.2
01-18-1994	04:01:26	34.36 N	118.62 W	A	76	.9	4.3
01-18-1994	07:23:56	34.33 N	118.62 W	A	74	14.8	4.0
01-18-1994	11:35:09	34.22 N	118.61 W	A	62	12.1	4.2
01-18-1994	13:24:44	34.32 N	118.56 W	A	69	1.7	4.3
01-18-1994	15:23:46	34.38 N	118.56 W	A	75	7.7	4.8
01-19-1994	04:40:48	34.36 N	118.57 W	A	74	2.6	4.3
01-19-1994	04:43:14	34.37 N	118.71 W	C	81	6.0	4.0
01-19-1994	09:13:10	34.30 N	118.74 W	A	77	13.0	4.1
01-19-1994	14:09:14	34.22 N	118.51 W	A	57	17.5	4.5
01-19-1994	21:09:28	34.38 N	118.71 W	A	83	14.4	5.1
01-19-1994	21:11:44	34.38 N	118.62 W	A	78	11.4	5.1
01-21-1994	18:39:15	34.30 N	118.47 W	A	64	10.6	4.5
01-21-1994	18:39:47	34.30 N	118.48 W	A	64	11.9	4.0
01-21-1994	18:42:28	34.31 N	118.47 W	A	65	7.9	4.2
01-21-1994	18:52:44	34.30 N	118.45 W	A	63	7.6	4.3
01-21-1994	18:53:44	34.30 N	118.46 W	A	63	7.7	4.3
01-23-1994	08:55:08	34.30 N	118.43 W	A	62	6.0	4.1
01-24-1994	04:15:18	34.35 N	118.55 W	A	72	6.5	4.6
01-24-1994	05:50:24	34.36 N	118.63 W	A	77	12.1	4.3
01-24-1994	05:54:21	34.36 N	118.63 W	A	77	10.9	4.2
01-27-1994	17:19:58	34.27 N	118.56 W	A	65	14.9	4.6
01-28-1994	20:09:53	34.38 N	118.49 W	A	72	.7	4.2
01-29-1994	11:20:35	34.31 N	118.58 W	A	69	1.1	5.1
01-29-1994	12:16:56	34.28 N	118.61 W	A	68	2.7	4.3
02-03-1994	16:23:35	34.30 N	118.44 W	A	63	9.0	4.0

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List Of Historic Earthquakes Of Magnitude 4.0 Or Greater Within 100 Km Of The Site
(CAL TECH DATA 1932-2006)

DATE	TIME	LATITUDE	LONGITUDE	Q	DIST	DEPTH	MAGNITUDE
02-05-1994	08:51:29	34.37 N	118.65 W	A	78	15.4	4.0
02-06-1994	13:19:27	34.29 N	118.48 W	A	63	9.3	4.1
02-25-1994	12:59:12	34.36 N	118.48 W	A	70	1.2	4.0
03-20-1994	21:20:12	34.23 N	118.47 W	A	57	13.1	5.2
05-25-1994	12:56:57	34.31 N	118.39 W	A	62	7.0	4.4
06-15-1994	05:59:48	34.31 N	118.40 W	A	62	7.4	4.1
12-06-1994	03:48:34	34.29 N	118.39 W	A	60	9.0	4.5
02-19-1995	21:24:18	34.05 N	118.92 W	A	74	15.6	4.3
06-21-1995	21:17:36	32.98 N	117.82 W	C	94	6.0	4.3
06-26-1995	08:40:28	34.39 N	118.67 W	A	82	13.3	5.0
03-20-1996	07:37:59	34.36 N	118.61 W	A	76	13.0	4.1
05-01-1996	19:49:56	34.35 N	118.70 W	A	80	14.4	4.1
04-26-1997	10:37:30	34.37 N	118.67 W	A	79	16.5	5.1
04-26-1997	10:40:29	34.37 N	118.67 W	A	80	14.6	4.0
04-27-1997	11:09:28	34.38 N	118.65 W	A	79	15.2	4.8
06-28-1997	21:45:25	34.17 N	117.34 W	A	90	10.0	4.2
01-05-1998	18:14:06	33.95 N	117.71 W	A	49	11.5	4.3
03-11-1998	12:18:51	34.02 N	117.23 W	A	93	14.9	4.5
08-20-1998	23:49:58	34.37 N	117.65 W	A	83	9.0	4.4
07-22-1999	09:57:24	34.40 N	118.61 W	A	79	11.6	4.0
02-21-2000	13:49:43	34.05 N	117.26 W	A	92	15.0	4.5
03-07-2000	00:20:28	33.81 N	117.72 W	A	44	11.3	4.0
01-14-2001	02:26:14	34.28 N	118.40 W	A	60	8.8	4.3
01-14-2001	02:50:53	34.29 N	118.40 W	A	60	8.4	4.0
09-09-2001	23:59:18	34.06 N	118.39 W	A	36	7.9	4.2
10-28-2001	16:27:45	33.92 N	118.27 W	A	18	21.1	4.0
12-14-2001	12:01:35	33.95 N	117.75 W	A	46	13.8	4.0
01-29-2002	05:53:28	34.36 N	118.66 W	A	78	14.1	4.2
09-03-2002	07:08:51	33.92 N	117.78 W	A	42	12.9	4.8
01-06-2005	14:35:27	34.13 N	117.44 W	A	80	4.2	4.4

NOTE: Q IS A FACTOR RELATING THE QUALITY OF EPICENTRAL DETERMINATION

A = +- 1 km horizontal distance; +- 2 km depth
B = +- 2 km horizontal distance; +- 5 km depth
C = +- 5 km horizontal distance; no depth restriction
D = >+- 5 km horizontal distance

Event qualities are highly suspect prior to 1990. Many of these event qualities are based on incomplete information according to Caltech.

Table 3
List Of Historic Earthquakes Of Magnitude 4.0 Or Greater Within 100 Km Of The Site
(CAL TECH DATA 1932-2006)

S E A R C H   O F   E A R T H Q U A K E   D A T A   F I L E 1

SITE: Rincon Long Beach

COORDINATES OF SITE ...... 33.7747 N 118.1917 W

DISTANCE PER DEGREE ..... 110.9 KM-N 92.6 KM-W

MAGNITUDE LIMITS .... 4.0 - 8.5

TEMPORAL LIMITS .... 1932 - 2006

SEARCH RADIUS (KM) 100

NUMBER OF YEARS OF DATA 74.04

NUMBER OF EARTHQUAKES IN FILE 4254

NUMBER OF EARTHQUAKES IN AREA 415

MACTEC Engineering and Consulting

Table 3
List Of Historic Earthquakes Of Magnitude 4.0 Or Greater Within 100 Km Of The Site
(RICHTER DATA 1906-1931)

DATE	TIME	LATITUDE	LONGITUDE	Q	DIST	DEPTH	MAGNITUDE
05-15-1910	15:47:00	33.70 N	117.40 W	D	74	.0	6.0
07-23-1923	07:30:26	34.00 N	117.25 W	D	91	.0	6.3

S E A R C H   O F   E A R T H Q U A K E   D A T A   F I L E 2

SITE: Rincon Long Beach

COORDINATES OF SITE ...... 33.7747 N 118.1917 W

DISTANCE PER DEGREE ..... 110.9 KM-N 92.6 KM-W

MAGNITUDE LIMITS .... 6.0 - 8.5

TEMPORAL LIMITS .... 1906 - 1931

SEARCH RADIUS (KM) 100

NUMBER OF YEARS OF DATA 26.00

NUMBER OF EARTHQUAKES IN FILE 35

NUMBER OF EARTHQUAKES IN AREA 2

MACTEC Engineering and Consulting

Table 3
List Of Historic Earthquakes Of Magnitude 4.0 Or Greater Within 100 Km Of The Site
(NOAA/CDMG DATA 1812-1905)

DATE	TIME	LATITUDE	LONGITUDE	Q	DIST	DEPTH	MAGNITUDE
02-09-1890	04:06:00	34.00 N	117.50 W	D	69	.0	7.0

S E A R C H O F E A R T H Q U A K E D A T A F I L E 3

SITE: Rincon Long Beach

COORDINATES OF SITE ...... 33.7747 N 118.1917 W

DISTANCE PER DEGREE ..... 110.9 KM-N 92.6 KM-W

MAGNITUDE LIMITS .... 7.0 - 8.5

TEMPORAL LIMITS .... 1812 - 1905

SEARCH RADIUS (KM) 100

NUMBER OF YEARS OF DATA 94.00

NUMBER OF EARTHQUAKES IN FILE 9

NUMBER OF EARTHQUAKES IN AREA 1

MACTEC Engineering and Consulting

Table 3
List Of Historic Earthquakes Of Magnitude 4.0 Or Greater Within 100 Km Of The Site
(NOAA/CDMG DATA 1812-1905)

S U M M A R Y   O F   E A R T H Q U A K E   S E A R C H

* * *

NUMBER OF HISTORIC EARTHQUAKES WITHIN 100 KM RADIUS OF SITE

MAGNITUDE RANGE	NUMBER
4.0 - 4.5	278
4.5 - 5.0	94
5.0 - 5.5	31
5.5 - 6.0	8
6.0 - 6.5	3
6.5 - 7.0	3
7.0 - 7.5	1
7.5 - 8.0	0
8.0 - 8.5	0

* * *

MACTEC Engineering and Consulting

Appendix E

Noise Data

C:\LARDAV\SLMUTIL\10APR_10.bin Interval Data

Long Beach Press-Telergam Mixed Use Development EIR Noise Measurments

Site Location	Meas Number	Date	Time	Duration	Leq	SEL	Lmax	Lmin	Peak	Uwpk	L(10)	L(33)	L(50)	L(90)	L(100)	L(100)
1	0	10Apr 06	11:28:05	1200.0	65.4	96.2	90.9	51.7	99.2	107.6	67.2	61.9	59.2	54.5	0.0	0.0
2	0	10Apr 06	11:52:24	1200.0	72.1	102.9	87.1	55.8	100.3	111.4	76.1	70.8	67.5	60.5	0.0	0.0
3	0	10Apr 06	14:01:13	1200.0	65.7	96.5	83.7	52.6	93.8	114.1	69.2	64.1	61.0	56.0	0.0	0.0
4	0	10Apr 06	14:35:52	1200.0	62.0	92.9	80.7	49.6	93.3	112.6	65.4	61.3	58.7	52.9	0.0	0.0

Site 1: 7th and Tribune Court, Sidewalk facing alley adjacent to chain link fence. Large trash truck immediately adjacent at end of reading.
Site 2: 6th and Pine, Corner on sidewalk.
Site 3: 7th Street and Magnolia Ave, grass adjacent to sidewalk in front of duplex/triplex
Site 4: Pine and Cypress Way, Sidewalk facing alley in front of condos.

ROADWAY TRAFFIC NOISE

Project:	LB Press Telegram	Project No. 05-58551
Date:	26-Jul-06	
Roadway:	7th St (Magnolia-Chestnut)	
Vehicle Noise Emission Levels*:	TNM	

RESULTS

DAY-NIGHT AVERAGE LEVEL (Ldn)	Ldn at Site 50 feet from road centerline	Distance to dBA Contour Line from roadway centerline, feet 75	70	65	60	55
Existing	69.2 dBA	#N/A	42	96	207	445
Existing + Project	69.4 dBA	#N/A	43	98	211	454
Future with Ambient Growth	69.2 dBA	#N/A	42	96	207	445
Future with Ambient Growth and Project	69.4 dBA	#N/A	43	98	211	454
Future with Ambient Growth and Cumulative Projects	72.6 dBA	29	75	162	348	751
Future with Ambient, Cumulative, and Project Growth	72.7 dBA	29	76	163	352	757

Change in Noise Levels	
Due to Project	0.1 dBA
Due to Ambient Growth	0.0 dBA
Due to Ambient and Cumulative	3.4 dBA
Due to All Future Growth	3.5 dBA

COMMUNITY NOISE EXPOSURE LEVEL (CNEL)	CNEL at Site 50 feet from road centerline	Distance to dBA Contour Line from roadway centerline, feet 75	70	65	60	55
Existing	69.6 dBA	#N/A	45	101	218	469
Existing + Project	69.7 dBA	#N/A	47	103	222	478
Future with Ambient Growth	69.6 dBA	#N/A	45	101	218	469
Future with Ambient Growth and Project	69.7 dBA	#N/A	47	103	222	478
Future with Ambient Growth and Cumulative Projects	73.0 dBA	31	79	170	367	791
Future with Ambient, Cumulative, and Project Growth	73.0 dBA	32	80	172	370	797

Change in Noise Levels	
Due to Project	0.1 dBA
Due to Ambient Growth	0.0 dBA
Due to Ambient and Cumulative	3.4 dBA
Due to All Future Growth	3.5 dBA

*NOTES: Based on algorithms from the Federal Highway Administration "Traffic Noise Model ®", FHWA-PD-96-010, January, 1998.

#N/A = Not Applicable

ROADWAY TRAFFIC NOISE

Project:	LB Press Telegram		Project No. 05-58551
Date:		26-Jul-06	
Roadway:	6th St (Magnolia-Chestnut)		
Vehicle Noise Emission Levels*:		TNM	

RESULTS

DAY-NIGHT AVERAGE LEVEL (Ldn)	Ldn at Site 50 feet from road centerline	Distance to dBA Contour Line from roadway centerline, feet 75	70	65	60	55
Existing	68.6 dBA	#N/A	36	87	188	404
Existing + Project	68.7 dBA	#N/A	37	89	191	412
Future with Ambient Growth	68.6 dBA	#N/A	36	87	188	404
Future with Ambient Growth and Project	68.7 dBA	#N/A	37	89	191	412
Future with Ambient Growth and Cumulative Projects	72.1 dBA	26	69	148	319	688
Future with Ambient, Cumulative, and Project Growth	72.1 dBA	26	69	150	322	695

Change in Noise Levels	
Due to Project	0.1 dBA
Due to Ambient Growth	0.0 dBA
Due to Ambient and Cumulative	3.5 dBA
Due to All Future Growth	3.5 dBA

COMMUNITY NOISE EXPOSURE LEVEL (CNEL)	CNEL at Site 50 feet from road centerline	Distance to dBA Contour Line from roadway centerline, feet 75	70	65	60	55
Existing	69.0 dBA	#N/A	39	92	198	426
Existing + Project	69.1 dBA	#N/A	40	93	201	434
Future with Ambient Growth	69.0 dBA	#N/A	39	92	198	426
Future with Ambient Growth and Project	69.1 dBA	#N/A	40	93	201	434
Future with Ambient Growth and Cumulative Projects	72.4 dBA	28	73	156	337	725
Future with Ambient, Cumulative, and Project Growth	72.5 dBA	28	73	158	339	731

Change in Noise Levels	
Due to Project	0.1 dBA
Due to Ambient Growth	0.0 dBA
Due to Ambient and Cumulative	3.5 dBA
Due to All Future Growth	3.5 dBA

*NOTES: Based on algorithms from the Federal Highway Administration "Traffic Noise Model ®", FHWA-PD-96-010, January, 1998.

#N/A = Not Applicable

ROADWAY TRAFFIC NOISE

Project: LB Press Telegram — Project No. 05-58551
Date: 26-Jul-06

Roadway: Pacific Ave (6th-7th)

Vehicle Noise Emission Levels*: TNM

RESULTS

DAY-NIGHT AVERAGE LEVEL (Ldn)	Ldn at Site 50 feet from road centerline	Distance to dBA Contour Line from roadway centerline, feet 75	70	65	60	55
Existing	66.3 dBA	#N/A	21	61	132	284
Existing + Project	66.3 dBA	#N/A	21	61	132	284
Future with Ambient Growth	66.3 dBA	#N/A	21	61	132	284
Future with Ambient Growth and Project	66.3 dBA	#N/A	21	61	132	284
Future with Ambient Growth and Cumulative Projects	70.2 dBA	#N/A	52	111	239	515
Future with Ambient, Cumulative, and Project Growth	70.2 dBA	#N/A	52	111	239	515

Change in Noise Levels	
Due to Project	0.0 dBA
Due to Ambient Growth	0.0 dBA
Due to Ambient and Cumulative	3.9 dBA
Due to All Future Growth	3.9 dBA

COMMUNITY NOISE EXPOSURE LEVEL (CNEL)	CNEL at Site 50 feet from road centerline	Distance to dBA Contour Line from roadway centerline, feet 75	70	65	60	55
Existing	66.7 dBA	#N/A	23	64	139	299
Existing + Project	66.7 dBA	#N/A	23	64	139	299
Future with Ambient Growth	66.7 dBA	#N/A	23	64	139	299
Future with Ambient Growth and Project	66.7 dBA	#N/A	23	64	139	299
Future with Ambient Growth and Cumulative Projects	70.5 dBA	18	54	117	252	543
Future with Ambient, Cumulative, and Project Growth	70.5 dBA	18	54	117	252	543

Change in Noise Levels	
Due to Project	0.0 dBA
Due to Ambient Growth	0.0 dBA
Due to Ambient and Cumulative	3.9 dBA
Due to All Future Growth	3.9 dBA

*NOTES: Based on algorithms from the Federal Highway Administration "Traffic Noise Model ®", FHWA-PD-96-010, January, 1998.

#N/A = Not Applicable

ROADWAY TRAFFIC NOISE

Project:	LB Press Telegram		Project No. 05-58551
Date:		26-Jul-06	

Roadway: 7th St (Pacific-Pine)

Vehicle Noise Emission Levels*: TNM

RESULTS

DAY-NIGHT AVERAGE LEVEL (Ldn)	Ldn at Site 50 feet from road centerline	Distance to dBA Contour Line from roadway centerline, feet				
		75	70	65	60	55
Existing	69.4 dBA	#N/A	44	99	212	458
Existing + Project	69.5 dBA	#N/A	45	100	216	466
Future with Ambient Growth	69.4 dBA	#N/A	44	99	212	458
Future with Ambient Growth and Project	69.5 dBA	#N/A	45	100	216	466
Future with Ambient Growth and Cumulative Projects	72.8 dBA	30	77	166	357	770
Future with Ambient, Cumulative, and Project Growth	72.9 dBA	31	78	167	361	777

Change in Noise Levels	
Due to Project	0.1 dBA
Due to Ambient Growth	0.0 dBA
Due to Ambient and Cumulative	3.4 dBA
Due to All Future Growth	3.4 dBA

COMMUNITY NOISE EXPOSURE LEVEL (CNEL)	CNEL at Site 50 feet from road centerline	Distance to dBA Contour Line from roadway centerline, feet				
		75	70	65	60	55
Existing	69.8 dBA	#N/A	47	104	224	482
Existing + Project	69.9 dBA	#N/A	49	106	228	490
Future with Ambient Growth	69.8 dBA	#N/A	47	104	224	482
Future with Ambient Growth and Project	69.9 dBA	#N/A	49	106	228	490
Future with Ambient Growth and Cumulative Projects	73.2 dBA	33	81	175	377	811
Future with Ambient, Cumulative, and Project Growth	73.2 dBA	33	82	176	380	818

Change in Noise Levels	
Due to Project	0.1 dBA
Due to Ambient Growth	0.0 dBA
Due to Ambient and Cumulative	3.4 dBA
Due to All Future Growth	3.4 dBA

*NOTES: Based on algorithms from the Federal Highway Administration "Traffic Noise Model ®", FHWA-PD-96-010, January, 1998.

#N/A = Not Applicable

ROADWAY TRAFFIC NOISE

Project: LB Press Telegram — Project No. 05-58551
Date: 26-Jul-06

Roadway: 6th St (Pacific-Pine)

Vehicle Noise Emission Levels*: TNM

RESULTS

DAY-NIGHT AVERAGE LEVEL (Ldn)	Ldn at Site 50 feet from road centerline	Distance to dBA Contour Line from roadway centerline, feet 75	70	65	60	55
Existing	68.5 dBA	#N/A	35	85	184	397
Existing + Project	68.6 dBA	#N/A	36	87	188	405
Future with Ambient Growth	68.5 dBA	#N/A	35	85	184	397
Future with Ambient Growth and Project	68.6 dBA	#N/A	36	87	188	405
Future with Ambient Growth and Cumulative Projects	72.0 dBA	25	68	145	313	675
Future with Ambient, Cumulative, and Project Growth	72.0 dBA	25	68	147	316	682

Change in Noise Levels	
Due to Project	0.1 dBA
Due to Ambient Growth	0.0 dBA
Due to Ambient and Cumulative	3.5 dBA
Due to All Future Growth	3.5 dBA

COMMUNITY NOISE EXPOSURE LEVEL (CNEL)	CNEL at Site 50 feet from road centerline	Distance to dBA Contour Line from roadway centerline, feet 75	70	65	60	55
Existing	68.8 dBA	#N/A	38	90	194	418
Existing + Project	69.0 dBA	#N/A	39	92	198	426
Future with Ambient Growth	68.8 dBA	#N/A	38	90	194	418
Future with Ambient Growth and Project	69.0 dBA	#N/A	39	92	198	426
Future with Ambient Growth and Cumulative Projects	72.3 dBA	27	71	153	330	711
Future with Ambient, Cumulative, and Project Growth	72.4 dBA	27	72	155	333	718

Change in Noise Levels	
Due to Project	0.1 dBA
Due to Ambient Growth	0.0 dBA
Due to Ambient and Cumulative	3.5 dBA
Due to All Future Growth	3.5 dBA

*NOTES: Based on algorithms from the Federal Highway Administration "Traffic Noise Model ®", FHWA-PD-96-010, January, 1998.

#N/A = Not Applicable

ROADWAY TRAFFIC NOISE

Project: LB Press Telegram — Project No. 05-58551
Date: 26-Jul-06

Roadway: Pine Ave (7th-8th)

Vehicle Noise Emission Levels*: TNM

RESULTS

DAY-NIGHT AVERAGE LEVEL (Ldn)	Ldn at Site 50 feet from road centerline	Distance to dBA Contour Line from roadway centerline, feet				
		75	70	65	60	55
Existing	63.4 dBA	#N/A	#N/A	35	85	183
Existing + Project	63.5 dBA	#N/A	#N/A	35	85	184
Future with Ambient Growth	63.4 dBA	#N/A	#N/A	35	85	183
Future with Ambient Growth and Project	63.5 dBA	#N/A	#N/A	35	85	184
Future with Ambient Growth and Cumulative Projects	66.9 dBA	#N/A	25	67	145	311
Future with Ambient, Cumulative, and Project Growth	66.9 dBA	#N/A	25	67	145	312

Change in Noise Levels	
Due to Project	0.0 dBA
Due to Ambient Growth	0.0 dBA
Due to Ambient and Cumulative	3.5 dBA
Due to All Future Growth	3.5 dBA

COMMUNITY NOISE EXPOSURE LEVEL (CNEL)	CNEL at Site 50 feet from road centerline	Distance to dBA Contour Line from roadway centerline, feet				
		75	70	65	60	55
Existing	63.8 dBA	#N/A	#N/A	38	89	192
Existing + Project	63.8 dBA	#N/A	#N/A	38	90	193
Future with Ambient Growth	63.8 dBA	#N/A	#N/A	38	89	192
Future with Ambient Growth and Project	63.8 dBA	#N/A	#N/A	38	90	193
Future with Ambient Growth and Cumulative Projects	67.3 dBA	#N/A	27	71	152	328
Future with Ambient, Cumulative, and Project Growth	67.3 dBA	#N/A	27	71	153	329

Change in Noise Levels	
Due to Project	0.0 dBA
Due to Ambient Growth	0.0 dBA
Due to Ambient and Cumulative	3.5 dBA
Due to All Future Growth	3.5 dBA

*NOTES: Based on algorithms from the Federal Highway Administration "Traffic Noise Model ®", FHWA-PD-96-010, January, 1998.

#N/A = Not Applicable

ROADWAY TRAFFIC NOISE

Project: LB Press Telegram Project No. 05-58551
Date: 26-Jul-06

Roadway: Pine Ave (5th-6th)

Vehicle Noise Emission Levels*: TNM

RESULTS

DAY-NIGHT AVERAGE LEVEL (Ldn)	Ldn at Site 50 feet from road centerline	Distance to dBA Contour Line from roadway centerline, feet				
		75	70	65	60	55
Existing	64.7 dBA	#N/A	#N/A	46	103	221
Existing + Project	64.7 dBA	#N/A	#N/A	46	102	221
Future with Ambient Growth	64.7 dBA	#N/A	#N/A	46	103	221
Future with Ambient Growth and Project	64.7 dBA	#N/A	#N/A	46	102	221
Future with Ambient Growth and Cumulative Projects	68.2 dBA	#N/A	33	81	175	376
Future with Ambient, Cumulative, and Project Growth	68.1 dBA	#N/A	33	81	175	376

Change in Noise Levels	
Due to Project	0.0 dBA
Due to Ambient Growth	0.0 dBA
Due to Ambient and Cumulative	3.5 dBA
Due to All Future Growth	3.5 dBA

COMMUNITY NOISE EXPOSURE LEVEL (CNEL)	CNEL at Site 50 feet from road centerline	Distance to dBA Contour Line from roadway centerline, feet				
		75	70	65	60	55
Existing	65.0 dBA	#N/A	#N/A	50	108	233
Existing + Project	65.0 dBA	#N/A	#N/A	50	108	233
Future with Ambient Growth	65.0 dBA	#N/A	#N/A	50	108	233
Future with Ambient Growth and Project	65.0 dBA	#N/A	#N/A	50	108	233
Future with Ambient Growth and Cumulative Projects	68.5 dBA	#N/A	35	85	184	397
Future with Ambient, Cumulative, and Project Growth	68.5 dBA	#N/A	35	85	184	396

Change in Noise Levels	
Due to Project	0.0 dBA
Due to Ambient Growth	0.0 dBA
Due to Ambient and Cumulative	3.5 dBA
Due to All Future Growth	3.5 dBA

*NOTES: Based on algorithms from the Federal Highway Administration "Traffic Noise Model ®", FHWA-PD-96-010, January, 1998.

#N/A = Not Applicable

ROADWAY TRAFFIC NOISE

Project: LB Press Telegram — Project No. 05-58551
Date: 26-Jul-06

Roadway: 7th (Locust-LB Blvd)

Vehicle Noise Emission Levels*: TNM

RESULTS

DAY-NIGHT AVERAGE LEVEL (Ldn)	Ldn at Site 50 feet from road centerline	Distance to dBA Contour Line from roadway centerline, feet: 75	70	65	60	55
Existing	69.6 dBA	#N/A	45	101	217	467
Existing + Project	69.6 dBA	#N/A	46	101	218	470
Future with Ambient Growth	69.6 dBA	#N/A	45	101	217	467
Future with Ambient Growth and Project	69.6 dBA	#N/A	46	101	218	470
Future with Ambient Growth and Cumulative Projects	72.9 dBA	31	78	169	363	783
Future with Ambient, Cumulative, and Project Growth	72.9 dBA	31	78	169	364	785

Change in Noise Levels	
Due to Project	0.0 dBA
Due to Ambient Growth	0.0 dBA
Due to Ambient and Cumulative	3.4 dBA
Due to All Future Growth	3.4 dBA

COMMUNITY NOISE EXPOSURE LEVEL (CNEL)	CNEL at Site 50 feet from road centerline	Distance to dBA Contour Line from roadway centerline, feet: 75	70	65	60	55
Existing	69.9 dBA	#N/A	49	106	229	492
Existing + Project	69.9 dBA	#N/A	49	107	230	495
Future with Ambient Growth	69.9 dBA	#N/A	49	106	229	492
Future with Ambient Growth and Project	69.9 dBA	#N/A	49	107	230	495
Future with Ambient Growth and Cumulative Projects	73.3 dBA	33	82	178	383	825
Future with Ambient, Cumulative, and Project Growth	73.3 dBA	34	83	178	384	827

Change in Noise Levels	
Due to Project	0.0 dBA
Due to Ambient Growth	0.0 dBA
Due to Ambient and Cumulative	3.4 dBA
Due to All Future Growth	3.4 dBA

*NOTES: Based on algorithms from the Federal Highway Administration "Traffic Noise Model ®", FHWA-PD-96-010, January, 1998.

#N/A = Not Applicable

ROADWAY TRAFFIC NOISE

Project: LB Press Telegram   Project No. 05-58551
Date: 26-Jul-06

Roadway: LB Blvd (7th-8th)

Vehicle Noise Emission Levels*: TNM

RESULTS

DAY-NIGHT AVERAGE LEVEL (Ldn)	Ldn at Site 50 feet from road centerline	Distance to dBA Contour Line from roadway centerline, feet				
		75	70	65	60	55
Existing	68.2 dBA	#N/A	33	81	176	378
Existing + Project	68.2 dBA	#N/A	33	82	176	379
Future with Ambient Growth	68.2 dBA	#N/A	33	81	176	378
Future with Ambient Growth and Project	68.2 dBA	#N/A	33	82	176	379
Future with Ambient Growth and Cumulative Projects	72.2 dBA	27	71	152	328	706
Future with Ambient, Cumulative, and Project Growth	72.3 dBA	27	71	152	328	706

Change in Noise Levels	
Due to Project	0.0 dBA
Due to Ambient Growth	0.0 dBA
Due to Ambient and Cumulative	4.1 dBA
Due to All Future Growth	4.1 dBA

COMMUNITY NOISE EXPOSURE LEVEL (CNEL)	CNEL at Site 50 feet from road centerline	Distance to dBA Contour Line from roadway centerline, feet				
		75	70	65	60	55
Existing	68.5 dBA	#N/A	36	86	185	398
Existing + Project	68.5 dBA	#N/A	36	86	185	399
Future with Ambient Growth	68.5 dBA	#N/A	36	86	185	398
Future with Ambient Growth and Project	68.5 dBA	#N/A	36	86	185	399
Future with Ambient Growth and Cumulative Projects	72.6 dBA	29	74	160	345	743
Future with Ambient, Cumulative, and Project Growth	72.6 dBA	29	74	160	345	744

Change in Noise Levels	
Due to Project	0.0 dBA
Due to Ambient Growth	0.0 dBA
Due to Ambient and Cumulative	4.1 dBA
Due to All Future Growth	4.1 dBA

*NOTES: Based on algorithms from the Federal Highway Administration "Traffic Noise Model ®", FHWA-PD-96-010, January, 1998.

#N/A = Not Applicable

ROADWAY TRAFFIC NOISE

Project:	LB Press Telegram		Project No. 05-58551
Date:		26-Jul-06	
Roadway:	6th (Elm-Atlantic)		
Vehicle Noise Emission Levels*:		TNM	

RESULTS

DAY-NIGHT AVERAGE LEVEL (Ldn)	Ldn at Site 50 feet from road centerline	Distance to dBA Contour Line from roadway centerline, feet 75	70	65	60	55
Existing	68.2 dBA	#N/A	33	82	177	381
Existing + Project	68.3 dBA	#N/A	34	83	178	384
Future with Ambient Growth	68.2 dBA	#N/A	33	82	177	381
Future with Ambient Growth and Project	68.3 dBA	#N/A	34	83	178	384
Future with Ambient Growth and Cumulative Projects	71.6 dBA	23	64	137	295	635
Future with Ambient, Cumulative, and Project Growth	71.6 dBA	23	64	137	296	637

Change in Noise Levels	
Due to Project	0.0 dBA
Due to Ambient Growth	0.0 dBA
Due to Ambient and Cumulative	3.3 dBA
Due to All Future Growth	3.3 dBA

COMMUNITY NOISE EXPOSURE LEVEL (CNEL)	CNEL at Site 50 feet from road centerline	Distance to dBA Contour Line from roadway centerline, feet 75	70	65	60	55
Existing	68.6 dBA	#N/A	36	87	186	402
Existing + Project	68.6 dBA	#N/A	36	87	188	404
Future with Ambient Growth	68.6 dBA	#N/A	36	87	186	402
Future with Ambient Growth and Project	68.6 dBA	#N/A	36	87	188	404
Future with Ambient Growth and Cumulative Projects	71.9 dBA	24	67	144	311	669
Future with Ambient, Cumulative, and Project Growth	71.9 dBA	25	67	145	311	671

Change in Noise Levels	
Due to Project	0.0 dBA
Due to Ambient Growth	0.0 dBA
Due to Ambient and Cumulative	3.3 dBA
Due to All Future Growth	3.3 dBA

*NOTES: Based on algorithms from the Federal Highway Administration "Traffic Noise Model ®", FHWA-PD-96-010, January, 1998.

#N/A = Not Applicable

ROADWAY TRAFFIC NOISE

Project: LB Press Telegram — Project No. 05-58551
Date: 26-Jul-06

Roadway: LB Blvd (3rd-4th)

Vehicle Noise Emission Levels*: TNM

RESULTS

DAY-NIGHT AVERAGE LEVEL (Ldn)	Ldn at Site 50 feet from road centerline	Distance to dBA Contour Line from roadway centerline, feet 75	70	65	60	55
Existing	67.0 dBA	#N/A	25	68	147	318
Existing + Project	67.1 dBA	#N/A	26	69	149	321
Future with Ambient Growth	67.0 dBA	#N/A	25	68	147	318
Future with Ambient Growth and Project	67.1 dBA	#N/A	26	69	149	321
Future with Ambient Growth and Cumulative Projects	71.2 dBA	21	60	130	280	604
Future with Ambient, Cumulative, and Project Growth	71.3 dBA	21	61	131	281	606

Change in Noise Levels	
Due to Project	0.1 dBA
Due to Ambient Growth	0.0 dBA
Due to Ambient and Cumulative	4.2 dBA
Due to All Future Growth	4.2 dBA

COMMUNITY NOISE EXPOSURE LEVEL (CNEL)	CNEL at Site 50 feet from road centerline	Distance to dBA Contour Line from roadway centerline, feet 75	70	65	60	55
Existing	67.4 dBA	#N/A	27	72	155	335
Existing + Project	67.4 dBA	#N/A	28	73	157	338
Future with Ambient Growth	67.4 dBA	#N/A	27	72	155	335
Future with Ambient Growth and Project	67.4 dBA	#N/A	28	73	157	338
Future with Ambient Growth and Cumulative Projects	71.6 dBA	23	64	137	295	636
Future with Ambient, Cumulative, and Project Growth	71.6 dBA	23	64	138	296	638

Change in Noise Levels	
Due to Project	0.1 dBA
Due to Ambient Growth	0.0 dBA
Due to Ambient and Cumulative	4.2 dBA
Due to All Future Growth	4.2 dBA

*NOTES: Based on algorithms from the Federal Highway Administration "Traffic Noise Model ®", FHWA-PD-96-010, January, 1998.

#N/A = Not Applicable

Appendix F

Traffic Study

Technical Appendices are available for review at the Planning and Building Department, Long Beach City Hall

LONG BEACH PRESS TELEGRAM SITE EIR TRAFFIC IMPACT STUDY

Prepared for

October 5 Development

Prepared by

Meyer, Mohaddes Associates

a business unit of Iteris, Inc.

August, 2006
16-J06-1644

LONG BEACH PRESS TELEGRAM SITE
EIR TRAFFIC IMPACT STUDY

Prepared for

October 5 Development
100 West Broadway Avenue, Suite 205
Long Beach, CA 90802

Prepared by

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Prepared Under the Supervision of:

REGISTERED PROFESSIONAL ENGINEER
LEON D. WARD
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TRAFFIC
STATE OF CALIFORNIA

Leon D. Ward **CA T.E. # 0206**

August, 2006
16-J06-1644

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EXECUTIVE SUMMARY

The proposed project involves the development of 542 residential units and 32,300 square feet of ground floor and basement commercial, office, and classroom space on an approximately 2.5-acre site in the City of Long Beach. The project site is located at 604 Pine Avenue, and encompasses one full downtown block bordered to the east by Locust Avenue, to the west by Pine Avenue, to the north by 7th Street and to the south by 6th Street, and bisected by Tribune Court, an alley. The project site is currently developed with the offices of the Long Beach Press-Telegram, a fast food restaurant, and a mixed-use building with office and entertainment uses and parking lots serving all or part of each site.

The project includes construction of two mixed-use high-rise towers, both 22 stories and 250 feet in height. A four- to eight-story podium would surround both the towers and the general perimeter of the site. Approximately 1,186 on-site parking spaces would be provided in a new parking structure consisting of four above-ground levels and three below-ground levels. Vehicular access to the site would be taken from Locust Avenue and 7th Street. The existing facade of the Meeker building, a City-designated historic landmark, and portions of the existing interior and facade of the Press-Telegram Building, a potentially historic building, would be preserved and incorporated into the proposed project.

The non-residential space in the Press-Telegram building will be inhabited by Cal State University Long Beach (CSULB) and Arts Council for offices, classrooms, and exhibit space. The 8,000 square feet of space in the Meeker Bldg will be used for the work space for the Live/Work Units.

The existing employees from the Press-Telegram building will be relocated to the Arco Building located in the 400 West block of Ocean Boulevard. The employee traffic generated by the existing offices was relocated in the traffic assignment model to account for their relocation to that site. The traffic related to the existing restaurant use was removed from the area intersections and street system.

The land uses surrounding the site include the Renaissance High School for the Arts and the International Elementary School to the north, retail and commercial service uses to the south, east, and west, and residential development to the southwest. During the school year, the north approach of the Locust/7th intersection is closed for one-half block during school hours.

The existing trips for the Meeker Building were not subtracted from the area streets and intersections as it was difficult to determine the exact number of vehicles that were generated by the building. It was assumed that the building does not currently generate a significant volume of traffic during the weekday AM and PM peak hours. Since these volumes were not removed in the final calculations, the analysis presents a conservative estimate of conditions.

A breakdown of the proposed Project is listed in Table E-1.

Table E-1: PROJECT DEVELOPMENT PLAN

Site Number	Parcel Size (acres)	Residential (units)	Other (sq ft)
New Development			
New Residential	2.5 acres (total site)	542	
New Live-Work Commercial Space			8,000
Office Space (basement)			11,970
Office Space (ground floor)			4,350
Classroom (ground floor)			3,080
Exhibit Space			4,900
Total		542	32,300
Existing Development to be Replaced or Relocated			
Restaurant to be Removed		Carry-out w/o drive-thru	
P-T Office to be Relocated		Approximately 230 employees	
Meeker Building		Various uses	
Source: October 5 Development			

Parking for approximately 1,193 cars is proposed in a concealed parking structure. Vehicular access to the project site would occur from Locust Avenue.

Existing Conditions

Based on consultation with the City of Long Beach, 42 key intersections were selected for analysis. These are intersections deemed most likely to experience significant impacts from the Project and therefore warrant detailed analysis. Of the 42 study intersections, 2 are currently controlled by stop signs. The remaining study intersections are controlled by traffic signals.

AM and PM peak-hour LOS analyses were conducted for the 42 study intersections based on the measured traffic volumes, geometries, signal timings, and the previously described methodologies. All intersection analyses are performed using the TRAFFIX (Traffic Impact Analysis) software program. The results indicate that 2 of the study intersections currently operate at LOS E or F in one or both of the weekday peak hours. The remaining intersections currently operate at LOS C or better.

Future Without-Project Conditions

The anticipated buildout year of the Project's is expected to be prior to 2015. The projection of Year 2015 Without-Project traffic consists of existing traffic plus ambient traffic growth (general background regional growth) plus growth in traffic generated by specific related projects expected to be completed by 2015.

Ambient growth is regional background growth from development and growth located outside the study area and increased activity at current development with the study area. Based on discussions with the City of Long Beach staff, an annual background growth rate of 1.00 percent was factored into the future traffic volumes.

The City provided a list of pending and approved building areas within the influence area that included apartments, condominiums, hotels, theatres, shopping centers, clubs, and restaurants. The list also provided key information concerning the location, number of units or square footage, and percent complete for each project. For this analysis, all related projects were assumed to be completed by the Year 2015.

Morning and evening peak-hour trip estimates for the related projects were developed generally based on rates published in the Institute of Transportation Engineer's publication *Trip Generation, 7th Edition*. Adjustments were included for pass-by and diverted/linked trips based on information in the ITE publication and rates developed for other developments in downtown Long Beach. A total of 3,879 AM and 5,354 PM trips will be generated by the related developments in the study area.

The trips generated by the related projects were assigned to the area street system based on the routes people will use to travel to and from the related project sites was determined based on the patterns of existing area traffic for similar types of developments and on patterns listed in previous traffic studies for the area.

Year 2015 Without-Project Traffic Operations

The projection of Year 2015 Without-Project traffic consists of existing traffic plus ambient traffic growth and traffic generated by the related projects. The results indicate that 4 of the study intersections will operate at LOS E or F. The remaining intersections will operate at LOS D or better.

Future With-Project Conditions

Project Traffic Generation

The first step in analyzing future traffic conditions with the Project is to estimate trip generation from the Project. For purposes of this study, a limited number of trips from the existing developments were assumed to consider a worst-case analysis. ITE Trip Generation rates were used to estimate future Project-related trips. The Project is expected to generate 190 new trips in the AM peak hour and 220 new trips in the PM peak hour.

Project Trip Distribution and Assignment

The routes people will use traveling to and from the project sites were determined based on the patterns of existing area traffic for similar types of developments, patterns listed in previous traffic studies for the area, and on a select-zone analysis using the SCAG 2030 regional model for the downtown Long Beach area. The Project access for each of the sites was based on the data in the project descriptions and a review of available redevelopment plans. For locations where defined plans were not available, access was assumed to be primarily from the major east-west streets for the larger development sites and from the side streets, is possible, for the smaller sites.

Year 2015 With-Project Traffic Operations
For the 2015 With-Project conditions, the results indicate that five of the study intersections will operate at LOS E or F in one or both of the weekday peak hours. The remaining intersections will operate at LOS D or better.

Based on the City's significance criteria, the Project would have ***significant impact*** at the following study area signalized intersections:

- Magnolia Avenue and 7th Street
- Alamitos Avenue and 7th Street

Congestion Management Program System Analysis
The intersections of Alamitos Avenue with 7th Street and with Ocean Boulevard are the only study area intersections that are part of the CMP Arterial intersection monitoring system. The results of the capacity analysis indicate that the project will increase demand at both of these intersections, but will only have a significant impact at the Alamitos/7th intersection. Therefore, the project will have a significant CMP impact at that intersections.

Discussions conducted with City staff along with other ongoing analysis of this location indicate that there are no feasible physical measures that could be developed at either intersection that would mitigate the Project's impact at this intersection. Therefore, the impact at this intersection would be considered significant and unavoidable.

A CMP arterial analysis was also completed for the CMP freeway monitoring station located along the I-710 Freeway. The analysis shows that the proposed project does not contribute more than the minimum 150 peak-period trips at the CMP mainline location and therefore will have no significant impact.

Parking Analysis
The Project is proposing to provide up to 1,186 parking spaces. Based on the City's parking code, the Project would be required to provide 1,390 parking spaces to satisfy the Projects parking requirement. This would leave a deficit of 204 spaces.

Recommended Improvements

Improvements to the area transportation system are proposed as part of the Project and as part of other area projects previously approved or under consideration by the City of Long Beach. The following discusses these improvements and proposed project mitigation measures.

Other Committed Improvements

One change to the existing street system that has been approved as part of a City Public Works project is the modification of the existing Long Beach Boulevard and 5th Street intersection. The intersection will be modified to allow full turning and through movements. The existing pedestrian traffic signal located south of the MTA Blue Line station will be moved to the intersection to control vehicle and pedestrian movements. This change will allow for east-west through movement, as well as, left turn into and out 5th Street from Long Beach Boulevard. This change has been included in the with- and without-project scenarios.

The proposed Shoreline Gateway project has been conditioned to install traffic signal at the intersections of Lime Avenue with 7th Street and 3rd Street. In addition, that project has proposed to remove the north approach of the Lime Avenue and Ocean Boulevard intersection and vacate the block of Lime Avenue between Ocean Boulevard and Medio Street.

Project Improvements

The Project will contribute to significant impacts at two of the study area intersections. The Alamitos/7th intersection is physically constrained with existing developments located close to the street and has other land-use limitations making expansion of the roadway cross-section impractical. At this intersection, operational improvements or policy-based changes may improve overall traffic conditions, but will not affect the volume-to-capacity calculation on which the impact criteria are based. At this location, a significant unavoidable impact may remain.

To mitigate and address the Project's significant impacts, the following measures are proposed:

<u>Alamitos Avenue and 7th Street</u>

Discussions conducted with City staff along with other ongoing analysis of this location indicate that there are no feasible physical measures that could be developed at this intersection that would mitigate the Project's impact at this intersection. Therefore, the impact at this intersection would be considered significant and unavoidable.

<u>Magnolia Avenue/7th Street</u>

The southbound approach at the intersection is currently striped with a one wide shared through/right-turn lane. In addition, a center median area is also striped out since no southbound left-turns are allowed at this intersection. The proposed mitigation is to restripe the southbound intersection approach to provide one dedicated right-turn lane and one through lane. This measure would mitigate the Project's impact at this intersection by reducing the effective change in the intersection's V/C ratio to less than significant.

Proposed Parking Mitigation Measures

Prior to site plan approval, the project applicant shall complete a parking demand study, including a shared parking analysis, after a class program is defined in order to determine whether the amount of parking proposed is sufficient to adequately accommodate the anticipated demand. The results of the analysis shall be subject to the review and approval of the City traffic engineer. If the parking demand study determines that the parking proposed for the project would be sufficient, a variance shall be requested in accordance with the City's Zoning Regulations.

However, if the study determines that parking would be insufficient or the variance request is denied, the project shall meet the City's parking requirements, in accordance with the Zoning Regulations.

Proposed Transit Mitigation Measures

Discussions with Long Beach Transit officials indicated that no system improvements should be required for the Project. However, they will monitor conditions and adjust/coordinate services as needed in the future to address changes in demand.

To encourage the use of public transit and non-auto trip making, the Project will include transportation demand management (TDM) feature outlined in the City's TDM policies including, where appropriate, bicycle parking, safe bicycle access to streets and parking, efficient pedestrian access, and pedestrian-friendly access to area transit facilities.

INTRODUCTION AND ENVIRONMENTAL SETTING

This report summarizes the results of a traffic impact analysis that was undertaken for the Press-Telegram EIR (hereafter know as the Project). The report summarizes the methodology, findings and conclusions of that traffic analysis. A total of 42 intersections in downtown Long Beach were analyzed. The analysis considered new vehicle trip making that will result from the Project, as well as traffic growth from other development (background growth and identified related projects) in the surrounding area. The study covers local and arterial roadways serving the project site. County of Los Angeles Congestion Management Program (CMP) guidelines were also used to assess the designated CMP roadway system.

Study Area

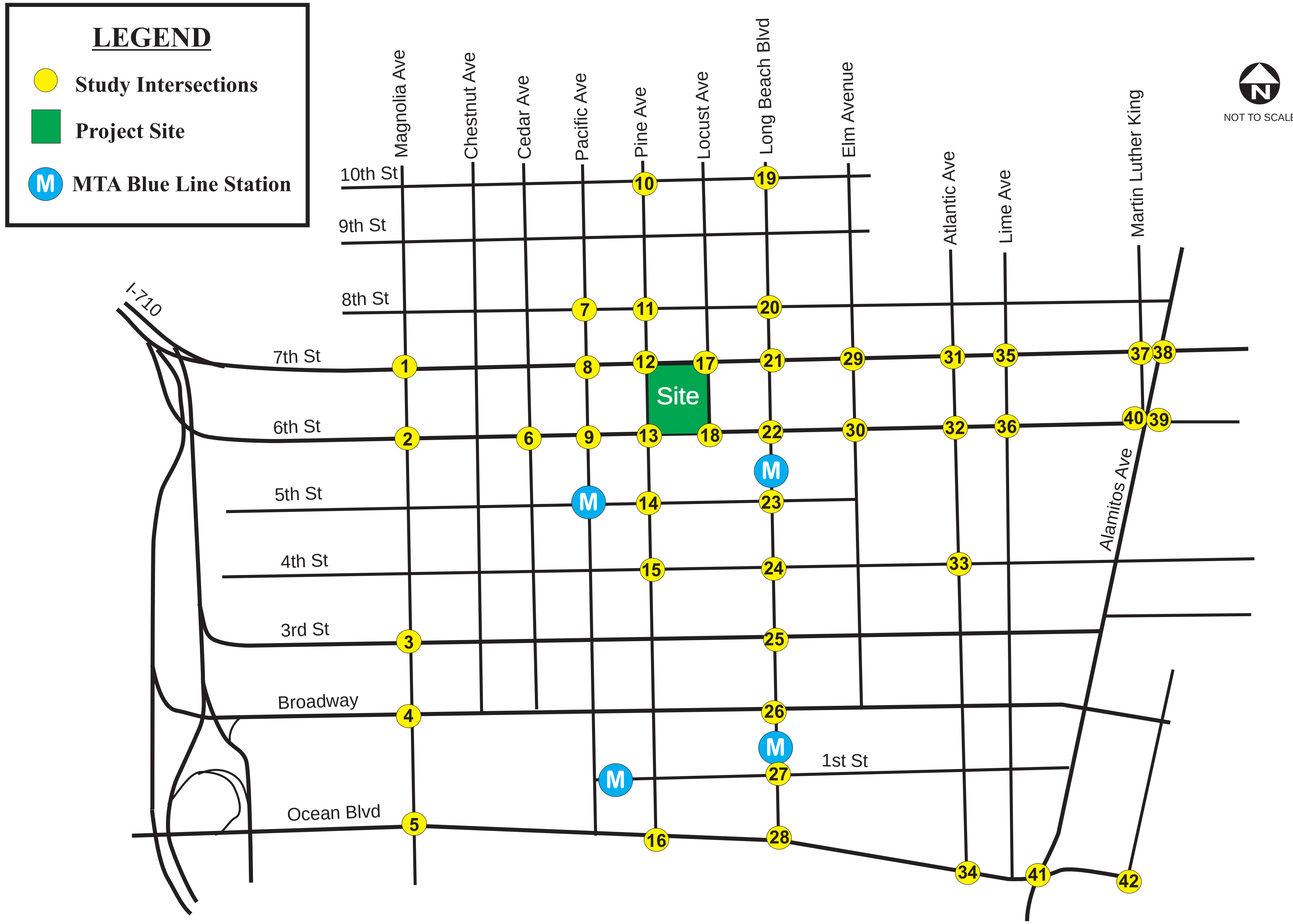
The Project is located in the Downtown Long Beach Redevelopment Project Area. The Downtown Long Beach Redevelopment Project Area was adopted on July 17, 1975. The Project Area includes 421 acres, all of which can be classified as urbanized. It is bounded generally on the west by Queen's Way and Magnolia Avenue to 3rd Street and by Pacific Avenue from 3rd Street to 7th Street; on the north by 7th Street; on the east by Elm Avenue from 7th to 1st Street and Atlantic Avenue from 1st Street to Ocean Boulevard and on the south by the shoreline from Queen's Way to Alamitos Avenue.

Figure 1 depicts the study area, the locations of the analyzed intersections, and the location of the Project. Based on consultation with the City of Long Beach, 42 key intersections were selected for analysis. These are intersections deemed most likely to experience significant impacts from the Project and therefore warranted detailed analysis. The 42 study intersections are:

1. Magnolia Ave & 7th St
2. Magnolia Ave & 6th St
3. Magnolia Ave & 3rd St
4. Magnolia Ave & Broadway
5. Magnolia Ave & Ocean Blvd
6. Cedar Ave & 6th St
7. Pacific Ave & 8th St
8. Pacific Ave & 7th St
9. Pacific Ave & 6th St
10. Pine Ave & 10th St
11. Pine Ave & 8th St
12. Pine Ave & 7th St
13. Pine Ave & 6th St
14. Pine Ave & 5th St
15. Pine Ave & 4th St
16. Pine Ave & Ocean Blvd
17. Locust Ave & 7th St
18. Locust Ave & 6th St
19. Long Beach Blvd & 10th St
20. Long Beach Blvd & 8th St
21. Long Beach Blvd & 7th St
22. Long Beach Blvd & 6th St
23. Long Beach Blvd & 5th St
24. Long Beach Blvd & 4th St
25. Long Beach Blvd & 3rd St
26. Long Beach Blvd & Broadway
27. Long Beach Blvd & 1st St
28. Long Beach Blvd & Ocean Blvd
29. Elm Ave & 7th St
30. Elm Ave & 6th St
31. Atlantic Ave & 7th St
32. Atlantic Ave & 6th St
33. Atlantic Ave & 4th St
34. Atlantic Ave & Ocean Blvd
35. Lime Ave & 7th St
36. Lime Ave & 6th St
37. Martin Luther King Ave & 7th St
38. Alamitos Ave & 7th St
39. Alamitos Ave & 6th St
40. MLK & 6th St
41. Alamitos/Shoreline Ave & Ocean
42. Orange Ave & Ocean Blvd

Of the 42 study intersections, only the Lime Avenue and 7th Street intersection is currently controlled by stop signs.

In addition, the intersection of Long Beach Boulevard and 5th Street will be modified in the future as part of a City Public Works project. The intersection will be modified to allow full east and westbound movement. An existing pedestrian traffic signal located mid-block between 5th and 6th Streets will be moved to this intersection. Currently, the east and west approaches have only right-turn in/out movements.



Meyer, Mohaddes Associates
a business unit of Iteris, Inc.

FIGURE 1
PROJECT LOCATION
Long Beach Press-Telegram Site EIR Traffic Study

Key Roadway Descriptions

The following describes key roadways within the study area:

Shoreline Drive is a Regional Corridor in the Long Beach General Plan and provides a key east-west access through the attraction portion of downtown Long Beach and provides direct access to the and from I-710. It has three lanes in each direction with a raised median and the posted speed limit is 45 miles per hour (mph). On-street parking is allowed along Shoreline Drive between Chestnut and Pine Avenues. The ADT in the study area ranges between 14,000 and 16,000 vehicles per day.

Ocean Boulevard provides east-west linkage through downtown and provides indirect access to the I-710 and I-110 freeways and eastern Long Beach. It is classified as a Major Arterial west of Alamitos Avenue and provides three lanes in each direction with a raised center median. To the east of Alamitos it is a four-lane, Minor Arterial. Parking is allowed on both sides of the street west of Magnolia Avenue and the posted speed limit is 30 mph. The ADT along Ocean Boulevard in the study area ranges between 36,000 and 39,000 vehicles per day.

Broadway is a three lane, one-way eastbound Major Arterial between the I-710 Freeway and Alamitos Avenue and a two-way Minor Arterial to the east of Alamitos. Parking is allowed along the north side of the street and the posted speed limit is 30 mph. The average daily traffic (ADT) along West Broadway in the study area ranges between 15,000 and 21,000 vehicles per day.

3rd Street also provides direct east-west access to the Project with access to sites 1, 2, 5, 6, 7, 9, 10, and 11. It is currently designated as a Major Arterial between the I-710 Freeway and Alamitos Avenue in the City of Long Beach Transportation Element of the General Plan. Adjacent to the project site, it is one-way and provides three lanes in the westbound direction. Parking is allowed on both sides of the roadway. The typical posted speed limit is 30 mph. The ADT along West 3rd Street in the study area ranges between 12,000 and 16,100 vehicles per day.

6th Street is a three lane, one-way eastbound Major Arterial between the I-710 Freeway and Alamitos Avenue and a two-way Minor Arterial to the east of Alamitos. Parking is allowed along some sections of the street and the posted speed limit is 30 mph. The average daily traffic (ADT) along 6th Street in the study area ranges between 1,300 and 13,100 vehicles per day.

7th Street is a three lane, one-way westbound Major Arterial between the I-710 Freeway and Alamitos Avenue and a two-way Regional Corridor to the east of Alamitos. Parking is allowed along some sections of the street and the posted speed limit is 30 mph. The average daily traffic (ADT) along 6th Street in the study area ranges between 13,100 and 31,300 vehicles per day.

Alamitos Avenue is north-south Regional Corridor extending south from Pacific Coast Highway to Shoreline Drive. In the study area it generally has two northbound and one southbound lane with left-turn lanes at most intersections. Alamitos Avenue is an important gateway street for traffic coming into and out of downtown Long Beach. On-street parking contributes congestion along Alamitos Avenue and along some blocks restricts the southbound traffic to one through, except between 7th and 3rd Streets where two southbound lanes are provided between 7AM and 9AM weekdays . In the study area, the ADT ranges between 14,400 and 25,200 vehicles per day.

Atlantic Avenue is a four lane, north-south Major Arterial that extends north from Ocean Boulevard to north of I-405. On-street parking is allowed along most of Atlantic Avenue in the study area. In the study area, the ADT ranges between 5,600 and 12,600 vehicles per day.

Long Beach Boulevard is a north-south Major Arterial that extends north from Ocean Boulevard to north of I-405. It has a wide median that accommodates the MTA Blue Line light rail with midblock turns restricted to accommodate train movements and limit vehicles turning across the tracks. In the study area, the ADT ranges between 8,900 and 17,700 vehicles per day.

Pine Avenue is a two-lane, north-south Minor Arterial that is a primary entertainment corridor in the downtown with many shops, restaurants, and theaters. It extends north from Shoreline Drive to Willow Street. In the study area, the ADT ranges between 4,000 and 6,800 vehicles per day.

Pacific Avenue is a north-south Major Arterial that provides access to the downtown area and contains the northbound portion of the MTA Blue Line transit route. Pacific Avenue has two travel lanes in each direction with no or limited on-street parking. The ADT along Pacific Avenue in the study area ranges between 3,000 and 11,200 vehicles per day.

Magnolia Avenue provides north-south linkage to the downtown and the Project. It is classified as Major Arterial south of 3rd Street and a Minor Arterial to the north in the City of Long Beach Transportation Element. It provides two lanes in each direction south of Broadway and one through lane in each direction to the north, with a two-way left-turn lanes and on-street parking on both sides north of Broadway. The ADT along Magnolia Avenue in the study area ranges between 4,500 and 13,700 vehicles per day.

I-710 Freeway is a north-south Regional Highway and provides access to the Project from the communities to the north, as well as the regional Interstate system. North of the study area it is part of the Los Angeles County Congestion Management Program's regional freeway system. The ADT along the I-710 Freeway in the study area is approximately 145,000 vehicles per day.

Project Description/Background

The Project involves the development of 542 residential units and 32,300 square feet of ground floor and basement commercial, office, and classroom space on an approximately 2.5-acre site in the City of Long Beach. The project site is located at 604 Pine Avenue, and encompasses one full downtown block bordered to the east by Locust Avenue, to the west by Pine Avenue, to the north by 7th Street and to the south by 6th Street, and bisected by Tribune Court, an alley. The project location is illustrated in Figure 2. The project includes construction of two mixed-use high-rise towers, both 22 stories and 250 feet in height. A four- to eight-story podium would surround both the towers and the general perimeter of the site. Approximately 1,193 on-site parking spaces would be provided in a new parking structure consisting of four above-ground levels and three below-ground levels. Vehicular access to the site would be taken from Locust Avenue and 7th Street. The existing facade of the Meeker building, a City-designated historic landmark, and portions of the existing interior and facade of the Press-Telegram Building, a potentially historic building, would be preserved and incorporated into the proposed project.

The non-residential space in the Press-Telegram building will be inhabited by Cal State University Long Beach (CSULB) and Arts Council for offices, classrooms, and exhibit space. The 8,000 square feet of space in the Meeker Bldg will be used for the work space for the Live/Work Units.

Existing Site Conditions

The project site is currently developed with the offices of the Long Beach Press-Telegram, a fast food restaurant, and a mixed-use building with office and entertainment uses and parking lots serving all or part of each site. The land uses surrounding the site include the Renaissance High School for the Arts and the International Elementary School to the north, retail and commercial service uses to the south, east, and west, and residential development to the southwest. During the school year, the north approach of the Locust/7th intersection is closed for one-half block during school hours.

A breakdown of the proposed Press-Telegram development is listed in Table 1.

Table 1: PROJECT DEVELOPMENT PLAN

Site Number	Parcel Size (acres)	Residential (units)	Other (sq ft)
New Development			
New Residential	2.5 acres (total site)	542	
New Live-Work Commercial Space			8,000
Office Space (basement)			11,970
Office Space (ground floor)			4,350
Classroom (ground floor)			3,080
Exhibit Space			4,900
Total		542	32,300
Existing Development to be Replaced or Relocated			
Restaurant to be Removed		Carry-out w/o drive-thru	
P-T Office to be Relocated		Approximately 230 employees	
Meeker Building		Various uses	
Source: October 5 Development			

Meyer, Mohaddes Associates
a business unit of Iteris, Inc.

Long Beach Press-Telegram Site
EIR Traffic Study

FIGURE 2
PRESS TELEGRAM PROJECT SITE

EXISTING CONDITIONS

Traffic Data Collection

An extensive field review was undertaken to establish existing traffic operations and conditions. . This included the verification of project descriptions, trip generation rates, ambient growth factors, trip distribution patterns, study intersections to be analyzed, and any special issues to be addressed in the study of this redevelopment area. A field inventory of intersection geometries, traffic controls, and other roadway conditions was completed with assistance from the City. The existing roadway lane configurations and traffic control are illustrated in Figure 3. The status of the existing buildings and building sites within the Project site and influence area was also noted. Turning movement traffic counts were collected during the morning (7-9 AM) and afternoon (4-6 PM) peak period. A summary of the existing intersections traffic volumes is illustrated in Figure 4.

Traffic Operations Analysis Methodology

Consistent with City of Long Beach guidelines for traffic impact analyses, traffic conditions in the vicinity of the project were analyzed using intersection capacity-based methodology known as the "Intersection Capacity Utilization Methodology" which is referred to hereinafter as the ICU Methodology.

The efficiency of traffic operations at a location is measured in terms of Level of Service (LOS). Level of service is a description of traffic performance at intersections. The level of service concept is a measure of average operating conditions at intersections during an hour. It is based on volume-to-capacity (V/C) ratio. Levels range from A to F with A representing excellent (free-flow) conditions and F representing extreme congestion. The ICU methodology compares the level of traffic during the peak hours at an intersection (volume) to the amount of traffic that intersection is able to carry (capacity). Intersections with vehicular volumes that are at or near capacity ($V/C \cong 1.0$) experience greater congestion and longer vehicle delays. Table 2 describes the level of service concept and the operating conditions expected under each level of service for signalized intersections.

Analysis of unsignalized intersections is conducted differently from signalized intersections due to different operating characteristics. Stop controlled intersections were analyzed using the delay-based Highway Capacity Manual (HCM) method of determining level of service. Table 3 also describes the LOS concept for unsignalized intersection.

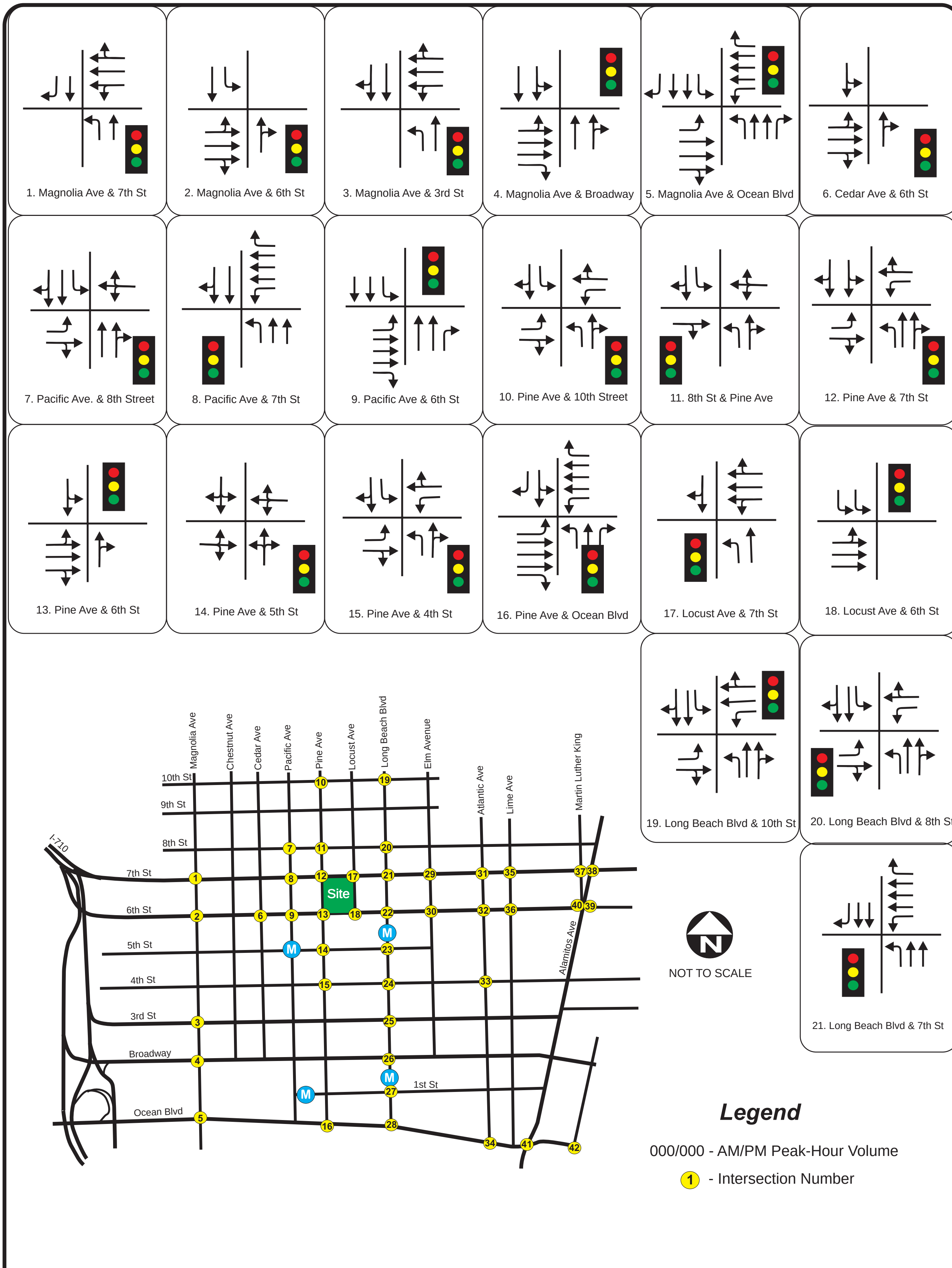


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FIGURE 3
EXISTING LANE CONFIGURATION AND TRAFFIC CONTROL

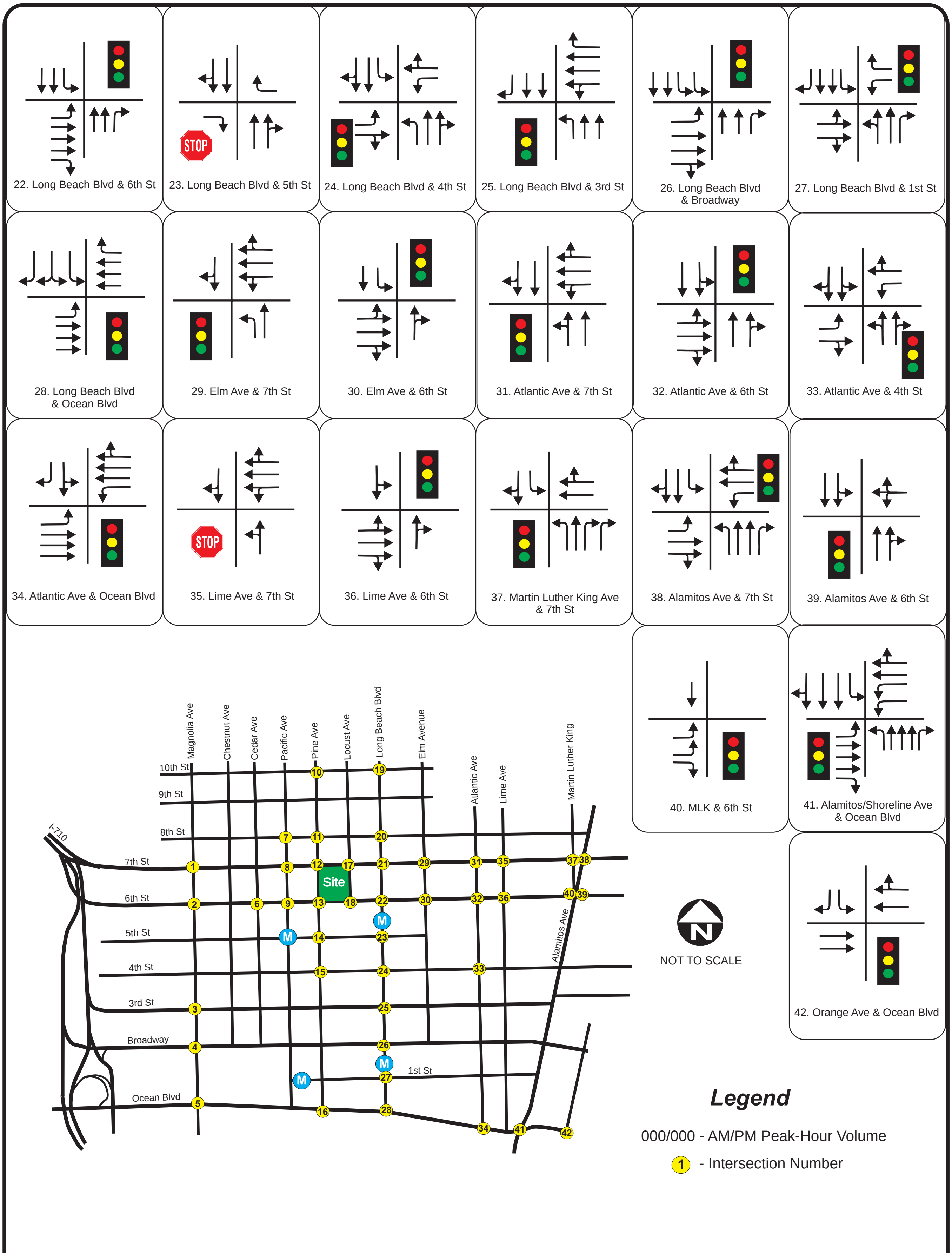

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FIGURE 3
EXISTING LANE CONFIGURATION AND TRAFFIC CONTROL

Figure 4: EXISTING PEAK-HOUR TRAFFIC VOLUMES

(Figure 4, Page 1 of 2)

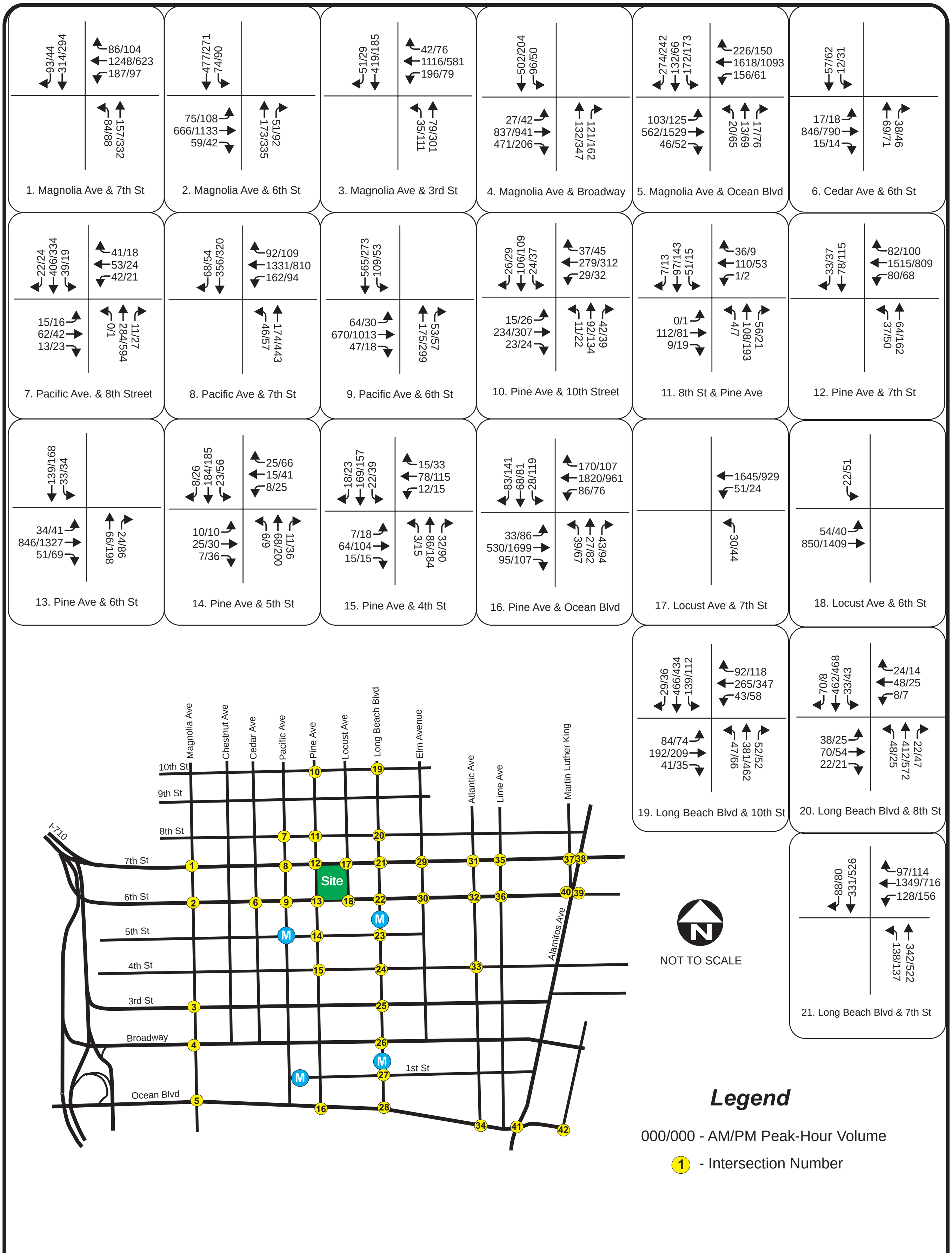

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FIGURE 4
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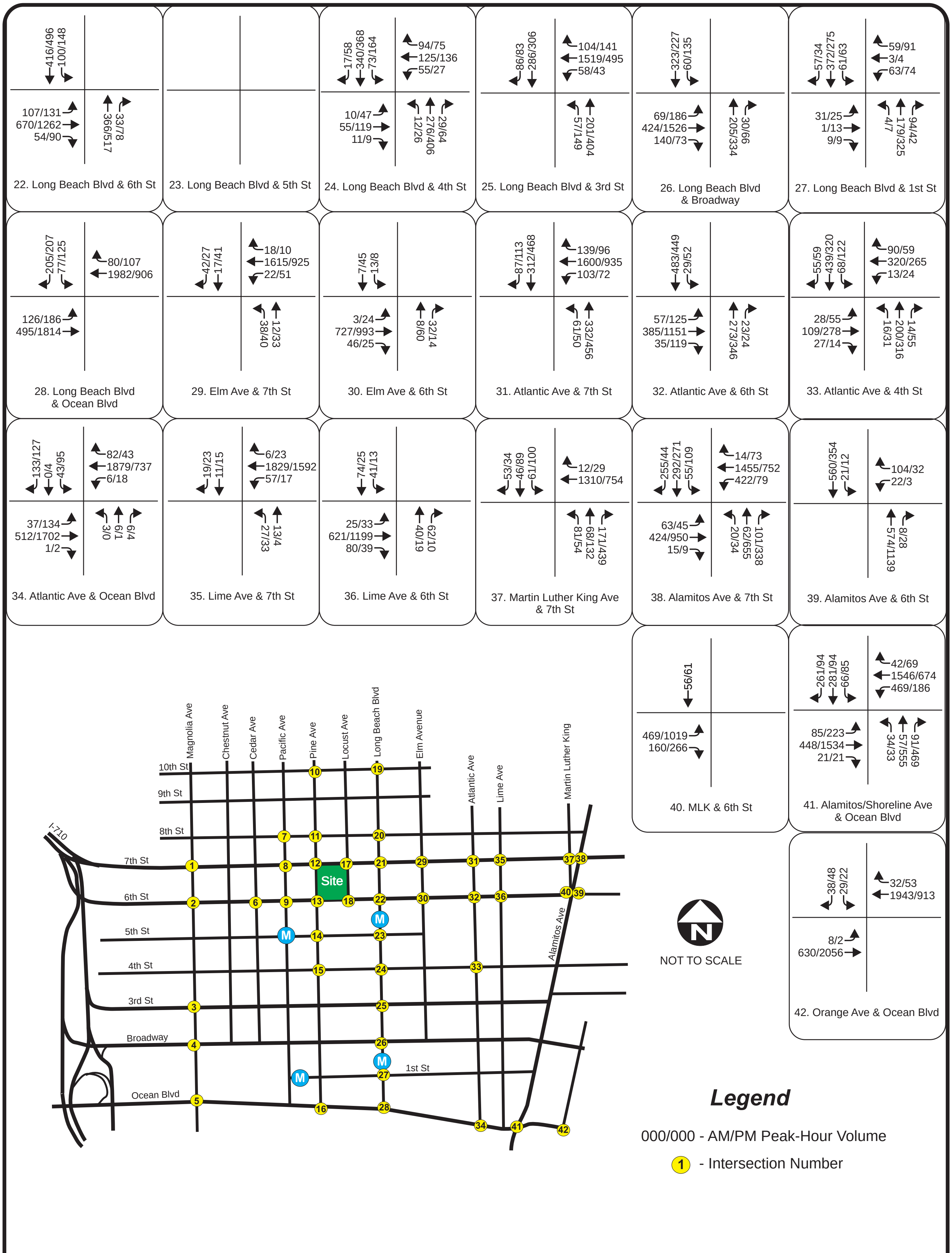

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FIGURE 4
EXISTING PEAK-HOUR TRAFFIC VOLUMES

(Figure 4, Page 2 of 2)

Table 2: LEVEL OF SERVICE DEFINITIONS

LOS	Interpretation	Volume to Capacity Ratio
A	Excellent operation - free-flow	0.000 - 0.600
B	Very good operation - stable flow, little or no delays	0.601 - 0.700
C	Good operation - slight delays	0.701 - 0.800
D	Fair operation – noticeable delays, queuing observed	0.801 - 0.900
E	Poor operation - long delays, near or at capacity	0.901 - 1.000
F	Forced flow – congestion	Over 1.000
Source: Highway Capacity Manual, Special Report 209, Transportation Research Board, Washington D.C., 1985 and Interim Materials on Highway Capacity, NCHRP Circular 212, 1982		

Table 3: LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS

Level of Service (LOS)	Highway Capacity Manual Average Control Delay (sec/veh)	Level of Service Description
A	< 10	Little or no delay
B	> 10 and ≤ 15	Short traffic delays
C	> 15 and ≤ 25	Average traffic delays
D	> 25 and ≤ 35	Long traffic delays
E	> 35 and ≤ 50	Very long traffic delays
F	> 50	Severe congestion

Existing Traffic Operations Analysis

AM and PM peak-hour LOS analyses were conducted for the 42 study intersections based on the measured traffic volumes, geometries, signal timings, and the previously described methodologies. All intersection analyses are performed using the TRAFFIX (Traffic Impact Analysis) software program. The existing conditions LOS analyses results are summarized in Table 4.

LOS D is generally considered to be the lowest acceptable LOS in an urban or suburban area. LOS E and F are considered to be unacceptable operating conditions that warrant mitigation. The results, shown in Table 4, indicate that 2 of the 42 study intersections are currently operating at LOS E or F during either the AM or PM peak hour or both. The remaining intersections currently operate at LOS D or better. The intersections that currently operate at poor service levels are:

- Lime Avenue and 7th Street
- Alamitos Avenue/Shoreline Drive and Ocean Boulevard

Table 4: EXISTING OPERATING CONDITIONS AT STUDY AREA INTERSECTION

Study Intersection		AM Peak			PM Peak		
		LOS	Del/Veh	V/C	LOS	Del/Veh	V/C
1	Magnolia Ave & 7th St	C		0.735	A		0.548
2	Magnolia Ave & 6th St	B		0.629	C		0.763
3	Magnolia Ave & 3rd St	A		0.597	A		0.478
4	Magnolia Ave & Broadway	B		0.619	A		0.527
5	Magnolia Ave & Ocean Blvd	B		0.697	B		0.695
6	Cedar Ave & 6th Street	A		0.409	A		0.417
7	Pacific Ave. & 8th Street	A		0.375	A		0.388
8	Pacific Ave & 7th St	B		0.610	A		0.479
9	Pacific Ave & 6th St	A		0.466	A		0.469
10	Pine Ave. & 10th Street	A		0.428	A		0.514
11	Pine Ave & 8th St	A		0.408	A		0.340
12	Pine Ave & 7th St	A		0.553	A		0.450
13	Pine Ave & 6th St	A		0.427	B		0.642
14	Pine Ave & 5th St	A		0.294	A		0.404
15	Pine Ave & 4th St	A		0.313	A		0.436
16	Pine Ave & Ocean Blvd	B		0.626	C		0.711
17	Locust Ave & 7th St	A		0.566	A		0.370
18	Locust Ave & 6th St	A		0.354	A		0.485
19	Long Beach Blvd & 10th St	A		0.584	A		0.574
20	Long Beach Blvd & 8th St	A		0.495	A		0.464
21	Long Beach Blvd & 7th St	B		0.637	A		0.536
22	Long Beach Blvd & 6th St	A		0.468	B		0.653
23	Long Beach Blvd & 5th St	N/A			N/A		
24	Long Beach Blvd & 4th St	A		0.419	A		0.563
25	Long Beach Blvd & 3rd St	A		0.574	A		0.423
26	Long Beach Blvd & Broadway	A		0.347	B		0.628
27	Long Beach Blvd & 1st St	A		0.312	A		0.361
28	Long Beach Blvd & Ocean Blvd	B		0.698	A		0.576
29	Elm Ave & 7th St	A		0.516	A		0.388
30	Elm Ave & 6th St	A		0.318	A		0.383
31	Atlantic Ave & 7th St	B		0.682	A		0.578
32	Atlantic Ave & 6th St	A		0.401	A		0.568
33	Atlantic Ave & 4th St	A		0.575	A		0.554
34	Atlantic Ave & Ocean Blvd	B		0.644	A		0.569
35	**Lime Ave & 7th St**	F	72.4		D	29.5	
36	Lime Ave & 6th St	A		0.368	A		0.416
37	Martin Luther King Ave & 7th S	B		0.660	B		0.623
38	Alamitos Ave & 7th St	D		0.823	C		0.775
39	Alamitos Ave & 6th St	A		0.404	A		0.526
40	MLK & 6th St	A		0.315	A		0.536
41	**Alamitos/Shoreline Ave & Ocean**	E		0.944	E		0.928
42	Orange Ave & Ocean Blvd	C		0.785	D		0.808

City of Long Beach Standards:
Signalized Intersection - ICU Methodology - Volume-to-Capacity Ratio (V/C)
Unsignalized Intersection - 2000 HCM Methodology - Delay per Vehicle (Del/Veh)

Parking

Parking for existing Press-Telegram building and restaurant are is provided in on-site surface parking lots. Parking for the Meeker Building is provided partially on-site in a small surface lot with patron parking being accommodated in the area on-street parking and public off-street lots. Public on-street parking is currently provided along Pine and Locust Avenues.

Existing Transit Service

There are five transit agencies that provide service around the proposed redevelopment sites: Metropolitan Transportation Authority (MTA), Long Beach Transit (LBT), Torrance Transit, Los Angeles Department of Transportation (LADOT) and Orange County Transportation Authority (OCTA). Together, the five transit agencies run a total 39 bus routes and 1 rail line within the boundaries of the proposed project, as described below:

<u>MTA Bus Service</u>

The MTA operates two bus lines daily through the 1st Street transit mall:

- *Metro Line 60/360 (Long Beach Boulevard- Santa Fe Avenue)*
- *Metro Line 232 (LAX to Long Beach)*

<u>MTA "Blue Line" Rail Service</u>

In addition to the 39 bus lines operating within the proposed project area, there is also one Metro light rail line that travels through downtown Long Beach. The Metro Blue Line is part of the Metro Rail Transit System that runs north-south from Los Angeles to Long Beach. The Metro Blue Line starts at 7th Street/Metro Center/Julian Dixon in downtown Los Angeles and travels south via Long Beach Avenue, Willowbrook Avenue, and Long Beach Boulevard to its final destination at the Long Beach Transit Mall. The train operates Monday through Sunday, including all major holidays.

<u>Long Beach Transit Bus Service</u>

Long Beach Transit operates 28 bus routes through the 1st Street transit mall:

- *Long Beach Transit Line 1 (Easy Avenue)*
- *Long Beach Transit Line 7 (Orange Avenue)*
- *Long Beach Transit Line 21 (Cherry Avenue)*
- *Long Beach Transit Line 22 (Downey Avenue)*
- *Long Beach Transit Line 23 (Cherry to Carson Street Only)*
- *Long Beach Transit Line 46 (Anaheim Street to downtown Long Beach)*
- *Long Beach Transit Line 51 (Long Beach Boulevard to Artesia Station)*
- *Long Beach Transit Line 52 (Long Beach Boulevard to Artesia Boulevard)*
- *Long Beach Transit Line 61 (Atlantic Avenue to Artesia Station)*
- *Long Beach Transit Line 62 (Atlantic Avenue to Alondra Boulevard)*
- *Long Beach Transit Line 63 (Atlantic Avenue to Artesia Boulevard)*
- *Long Beach Transit Line 66 (ZAP Atlantic)*
- *Long Beach Transit Line 81 (10th Street to CSULB)*

- *Long Beach Transit Line 91 (7th Street / Bellflower Boulevard)*
- *Long Beach Transit Line 92 (7th Street / Woodruff Avenue)*
- *Long Beach Transit Line 93 (7th Street / Clark Avenue)*
- *Long Beach Transit Line 94 (7th Street to Los Altos Only)*
- *Long Beach Transit 96 ZAP (The 96 ZAP 7th Street)*
- *Long Beach Transit Line 111 (Broadway / Lakewood Boulevard)*
- *Long Beach Transit Line 112 (Broadway / Clark Avenue)*
- *Long Beach Transit Line 172 (PCH / Palo Verde)*
- *Long Beach Transit Line 173 (PCH / Studebaker)*
- *Long Beach Transit Line 174 (PCH / Ximeno Avenue Only)*
- Long Beach Transit Line 181 (Magnolia / 4th Street)
- Long Beach Transit Line 182 (Pacific Avenue / 4th Street)
- Long Beach Transit Line 191 (Santa Fe / Del Amo Boulevard)
- Long Beach Transit Line 192 (Santa Fe / South Street)
- Long Beach Transit Line 193 (Santa Fe via McHelen to Del Amo Station)

In addition, LBT operates free shuttle buses (the Passport) in the downtown area and between major attractions near the downtown. Passport routes in the Project vicinity include:

- Passport A (Alamitos Bay Landing)
- Passport C (Queen Mary)
- Passport D (Los Altos)
- Tour D’Art

<u>Torrance Transit Bus Service</u>

Torrance Transit Line 3 (Redondo Beach to downtown Long Beach) travels east-west from the Redondo Beach Pier to downtown Long Beach. It operates Monday through Sunday, excluding New Year’s Day, Thanksgiving Day and Christmas.

<u>LADOT Transit Service</u>

The Los Angeles Department of Transportation (LADOT) Commuter Express Line 142 (San Pedro / Terminal Island / Long Beach Express) runs predominately east-west from Ports O’Call and Sampson in San Pedro to the Long Beach Transit Mall via 10th Street, SR-47, Ocean Boulevard and Long Beach Boulevard. It operates Monday through Sunday, including all major holidays.

<u>OCTA Transit Service</u>

Orange County Transportation Authority (OCTA) Route 60 (Long Beach to Tustin) operates through the 1st Street transit mall. It runs east-west from the Long Beach Transit Mall to Larwin Square in Tustin via 7th Street, Westminster and 17th Street. It operates Monday through Sunday, including all major holidays.

FUTURE YEAR WITHOUT-PROJECT ANALYSIS

To evaluate the potential impact of the proposed project on local traffic conditions, it is first necessary to develop a forecast of future traffic volumes in the study area under conditions without the Project. This provides a basis against which to measure the Project's traffic impacts.

The anticipated buildout year of the Project's is expected to be completed by the Year 2015. The projection of Year 2015 No-Project traffic consists of existing traffic plus ambient traffic growth (general background regional growth) plus growth in traffic generated by specific cumulative projects expected to be completed by 2015. The following describes the two growth components.

Background Traffic Growth

Ambient growth is regional background growth from development and growth located outside the study area and increased activity at current development within the study area. Based on discussions with the City of Long Beach staff, an annual background growth rate of 1.00 percent was factored into the future traffic volumes.

Growth From Cumulative Projects

In addition, there are adjacent projects in the downtown area generating AM and PM trips impacting the study area.

The City provided a list of pending and approved building areas within the influence area. It was recognized that additional traffic growth occurred from cumulative development projects adjacent to the study area including apartments, condominiums, hotels, theatres, shopping centers, clubs, and restaurants. The City provided a list of new development and redevelopment projects in the general area. The list also provided key information concerning the location, number of units or square footage, and percent complete for each project. For this analysis, all cumulative projects were assumed to be completed by the Year 2015.

Morning and evening peak-hour trip estimates for these cumulative projects were developed based on rates published in the Institute of Transportation Engineer's publication *Trip Generation, 7th Edition*.

Adjustments were included for pass-by and non-auto trips based on information in the ITE trip generation publication and rates developed for other developments in downtown Long Beach. While transit access to all of the downtown sites is available, the location of the transit stops in relation to the site locations an explicit reduction in trips for transit use was not included. This is because the overall use of transit in the area could not be defined and the trip rates for uses such as apartments in the ITE manual include some use of transit in their calculations. Therefore, the trip estimates may be considered a worst-case projection. Table 5 presents a summary the number of AM and PM trips generated from the cumulative projects. A total of 3,879 AM and 5,354 PM trips will be generated by the cumulative developments in the study area.

Table 5: CUMULATIVE PROJECT DEVELOPMENT TRIP GENERATION

	Related Projects	Location	Pending/Approved Projects: Apt.. Units	Condo Units	Hotel Rooms	Retail / Studio Sq. Ft. (1000's)	Restaurant Sq. Ft. (1000's)	Land Use Types	ITE Rate Code	ITE Rate Type & In/Out Percentages: AM In	AM Out	PM In	PM Out	AM Rate In	AM Rate Out	PM Rate In	PM Rate Out	ITE Trip Generation Rate/Development Generated Trips: AM Total Rate: Apts	Condos	Hotel	Retail	Office	Restaurant	Total AM Trips	PM Total Rate: Apts	Condos	Hotel	Retail	Office	Restaurant	Total PM Trips	Complete and Occupied (a)	Reduction for Pass-By and Non-Auto Linked Trips (%): Retail - PM	Restaurant - AM	Restaurant - PM	Total Trips: AM Total Trips	AM Ins	AM Outs	PM Total Trips	PM Ins	PM Outs	Daily Total Trips
1.)	100 E. Ocean Blvd	100 E. Ocean Blvd	155					Apartment	220	20%	80%	65%	35%	0.10	0.41	0.43	0.23	0.51						80	0.66						103	No				80	16	64	103	67	36	1,082
3.)	Ocean Villas	350 E. Ocean Blvd.	556					Apartment	220	20%	80%	65%	35%	0.10	0.40	0.38	0.20	0.50						276	0.58						323	No				276	55	221	323	210	113	3,492
4.)	Insurance Exchange - Condo	201 E. Broadway		11				Condo	230	17%	83%	67%	33%	0.14	0.67	0.60	0.30		0.80					9		0.89					10	No				9	2	7	10	7	3	98
5.)	Broadway Lofts - Condo	224 - 248 E. Broadway (southwest corner of Broadway / Long Beach Blvd)		48				Condo	230	17%	83%	67%	33%	0.10	0.50	0.46	0.23		0.60					29		0.69					33	No				29	5	24	33	22	11	344
	Broadway Lofts - Retail	225 - 248 E. Broadway (southwest corner of Broadway / Long Beach Blvd)				14		Retail	820	61%	39%	48%	52%	2.12	1.36	5.93	6.42				3.48			47				12.35			167	No	50%			47	29	18	84	80	3	1,853
		225 - 248 E. Broadway (southwest corner of Broadway / Long Beach Blvd)					3	Restaurant	932	52%	48%	61%	39%	5.99	5.53	6.66	4.26						11.52	36						10.92	34	No		25%	43%	27	19	8	20	12	8	400
6.)	Promenade - Olson - Apartment	133 The Promenade	83					Apartment	220	20%	80%	65%	35%	0.11	0.43	0.50	0.27	0.53						44	0.76						63	No				44	9	36	63	41	22	649
	Promenade - Olson - Retail	133 The Promenade				22		Retail	820	61%	39%	48%	52%	1.74	1.11	5.00	5.41				2.85			64				10.41			233	No	50%			64	39	25	117	112	5	2,570
7.)	Promenade - Greystone - Apartment	200 E. Broadway	62					Apartment	220	20%	80%	65%	35%	0.11	0.44	0.54	0.29	0.55						34	0.83						52	No				34	7	27	52	34	18	523
	Promenade - Greystone - Retail	200 E. Broadway				9		Retail	820	61%	39%	48%	52%	2.45	1.57	6.70	7.26				4.02			38				13.95			132	No	50%			38	23	15	66	63	3	1,467
8.)	Promenade - Lyon - Apartment	Promenade site between Broadway and 3rd Street	96					Apartment	220	20%	80%	65%	35%	0.11	0.42	0.48	0.26	0.53						51	0.73						70	No				51	10	41	70	46	25	727
	Promenade - Lyon - Retail	Promenade site between Broadway and 3rd Street				14		Retail	820	61%	39%	48%	52%	2.10	1.34	5.86	6.35				3.44			48				12.22			171	No	50%			48	29	19	86	82	3	1,892
9.)	City Place Lofts	4th Street and Elm Ave	72					Apartment	220	20%	80%	65%	35%	0.11	0.43	0.52	0.28	0.54						39	0.80						57	No				39	8	31	57	37	20	583
11.)	The Pike - Retail	Shoreline Drive and Pine Ave				96		Retail	820	61%	39%	48%	52%	0.73	0.47	2.29	2.48				1.59			153				6.35			608	25%	34%			114	70	45	402	219	183	6,603
15.)	Newberry's	433 Pine Avenue	30					Apartment	220	20%	80%	65%	35%	0.12	0.49	0.74	0.40	0.61						18	1.14						34	No				18	4	15	34	22	12	331
16.)	D' Orsay Embassy Suites	201 Promenade (Boadway and Promenade)			162			Hotel	310	61%	39%	53%	47%	0.28	0.18	0.31	0.28			0.46				74			0.59				96	No				74	45	29	96	51	45	1,823
	D' Orsay Embassy Suites - Retail	201 Promenade (Boadway and Promenade)				4		Retail	820	61%	39%	48%	52%	3.46	2.21	8.98	9.73				5.67			23				18.70			75	No	50%			23	14	9	37	36	1	838
	D' Orsay Embassy Suites - Resturant	201 Promenade (Boadway and Promenade)					7	Restaurant	932	52%	48%	60%	40%	5.99	5.53	6.55	4.37						11.52	81						10.92	76	No		20%	20%	65	42	23	61	37	24	890
18.)	World Trade Center	600 W. Broadway		1,329				Condo	230	17%	83%	67%	33%	0.05	0.26	0.25	0.12		0.31					409		0.38					501	No				409	70	339	501	336	165	5,787
	World Trade Center - Retail	600 W. Broadway				10		Retail	820	61%	39%	48%	52%	2.40	1.53	6.57	7.12				3.93			39				13.70			137	No	50%			39	24	15	68	66	3	1,520
19.)	Jamboree - West Gateway	745 W. 3rd St	64					Apartment	220	20%	80%	65%	35%	0.11	0.44	0.54	0.29	0.55						35	0.83						53	No				35	7	28	53	34	18	535
20.)	Lyon - West Gateway	643 W. Broadway	345					Apartment	220	20%	80%	65%	35%	0.10	0.40	0.39	0.21	0.50						173	0.60						207	No				173	35	138	207	135	73	2,224
	Lyon - West Gateway - Retail	643 W. Broadway				15		Retail	820	61%	39%	48%	52%	2.04	1.30	5.73	6.20				3.34			50				11.93			179	No	100%			0	0	0	0	0	0	1,979
21.)	Greystone - West Gateway	505 W. Broadway		164				Condo	230	17%	83%	67%	33%	0.08	0.39	0.37	0.18		0.47					77		0.55					90	No				77	13	64	90	60	30	977
22.)	Olson - West Gateway	421 W. Broadway		190				Condo	230	17%	83%	67%	33%	0.08	0.38	0.36	0.18		0.45					86		0.54					102	No				86	15	72	102	68	34	1,108
25.)	Cedar Court - Residential	210 W. 3rd St	94					Apartment	220	20%	80%	65%	35%	0.11	0.42	0.48	0.26	0.53						50	0.74						69	No				50	10	40	69	45	24	715
	Cedar Court - Retail	210 W. 3rd St				3		Retail	820	61%	39%	48%	52%	3.90	2.50	9.95	10.78				6.40			19				20.72			61	No	67%			19	12	7	20	29	-9	689
26.)	Cedar Court - Office	Cedar between 3rd and Broadway				123		Office	710	88%	12%	17%	83%	0.00	0.00	0.00	0.00					1.55		190					1.49		183	No				190	167	23	183	31	152	1,560
27.)	Pike- South Restaurants	Shoreline Drive and Pine Ave					14	Restaurant	932	52%	48%	60%	40%	5.99	5.53	6.55	4.37						11.52	160						10.92	152	No		5%	43%	152	83	69	87	52	35	1,771
28.)	Sierra Hotel	285 Bay St			140			Hotel	310	61%	39%	53%	47%	0.27	0.17	0.31	0.28			0.44				62			0.59				83	No				62	38	24	83	44	39	1,626
31.)	Camden Phase II	400 W. Ocean Blvd	246					Apartment	220	20%	80%	65%	35%	0.10	0.40	0.40	0.22	0.51						124	0.62						153	No				124	25	99	153	99	54	1,629
32.)	Camden Phase III	150 W. Ocean Blvd	216					Apartment	220	20%	80%	65%	35%	0.10	0.41	0.41	0.22	0.51						110	0.63						136	No				110	22	88	136	89	48	1,449
	Ocean Center	110 W. Ocean Blvd	45					Apartment	220	20%	80%	65%	35%	0.11	0.46	0.61	0.33	0.57						26	0.94						42	No				26	5	21	42	28	15	421
33.)	Walgreens w/ drive-thru	640 Long Beach Blvd				12		Retail	881	57%	43%	49%	51%	2.08	1.57	6.31	6.57				3.65			44				12.87			154	No	67%			44	25	19	51	76	-25	1,058
34.)	Best Western	517 E. 1st St			69			Hotel	310	61%	39%	53%	47%	0.23	0.15	0.31	0.28			0.37				26			0.59				41	No				26	16	10	41	22	19	991
35.)	Temple Lofts	835 Locust Ave		82				Condo	230	25%	75%	57%	43%	0.17	0.50	0.47	0.36		0.66					54		0.83					68	No				54	14	41	68	39	29	542
36.)	Residential Rental Units	427 W. 6th St	10					Apartment	220	20%	80%	65%	35%	0.17	0.69	1.50	0.81	0.86						9	2.32						23	No				9	2	7	23	15	8	210
37.)	Residential Condominiums	125 Linden Ave		30				Condo	230	17%	83%	67%	33%	0.11	0.55	0.50	0.25		0.66					20		0.75					22	No				20	3	16	22	15	7	231
	Retail	125 Linden Ave				2		Retail	820	61%	39%	48%	52%	4.57	2.92	11.36	12.31				7.48			15				23.67			47	No	34%			15	9	6	31	23	9	534
38.)	Condominium Conversion	250 Pacific Ave		142				Condo	230	17%	83%	67%	33%	0.08	0.40	0.38	0.19		0.48					68		0.56					80	No				68	12	57	80	54	26	865
40.)	Residential	350 Long Beach Blvd		82				Condo	230	17%	83%	67%	33%	0.09	0.45	0.42	0.21		0.54					44		0.62					51	No				44	7	37	51	34	17	542
	Retail	350 Long Beach Blvd				7		Retail	820	61%	39%	48%	52%	2.77	1.77	7.42	8.04				4.53			32				15.46			108	No	50%			32	19	12	54	52	2	1,206
41.)	DTCA Site #1 - Mixed Use	Pacific between 3rd and 4th		171		20		Condo		See Appendix Table				See Appendix Table										-							-	No	5%			88	20	68	141	85	56	1,538
42.)	DTCA Site #2 - Mixed Use	Broadway and 1st Street		446		11		Condo		See Appendix Table				See Appendix Table										-							-	No	5%			203	53	150	337	198	139	3,748
43.)	DTCA Site #3 - Art Exchange Block	Broadway and Long Beach Blvd.		179		16		Mixed		See Appendix Table				See Appendix Table																		No	5%			172	68	104	192	120	72	2,038
44.)	DTCA Site #4 - Residential	1st Street and Elm		54				Condo		See Appendix Table				See Appendix Table																		No	5%			18	3	11	3	3	0	43
45.)	DTCA Site #5 - City Hall East	Broadway and Elm		72				Condo		See Appendix Table				See Appendix Table																		No	5%			8	-24	32	9	25	-16	248
46.)	DTCA Site #6 - Von's Site	Atlantic and Broadway				62		Retail		See Appendix Table				See Appendix Table																		No	5%			148	100	48	341	164	177	2,933
47.)	DTCA Site #7 - Mixed Use	5th Street and Pacific		141		23		Mixed		See Appendix Table				See Appendix Table																		No	5%			33	4	29	28	20	8	318
49.)	DTCA Site #8 - Resdiential	Pine and 5th	118					Apartment		See Appendix Table				See Appendix Table																		No	5%			12	-10	22	-39	-9	-30	-499
51/52.)	Apartment / Hotel	432 W. Ocean Blvd		80				Condo	230	17%	83%	67%	33%	0.09	0.45	0.42	0.21		0.54					43		0.63					50	No				43	7	36	50	34	17	531
	Hotel	432 W. Ocean Blvd			140			Hotel	310	61%	39%	53%	47%	0.27	0.17	0.31	0.28			0.44				62			0.59				83	No				62	38	24	83	44	39	1,626
50	Shoreline gateway	777 W. Ocean Blvd		358		13.6		Mixed		See Appendix Table				See Appendix Table																						148	37	111	278	157	121	3,080
																																			Total Trips Generated	3,879	1,353	2,522	5,354	3,463	1,891	71,938

(a) Portions of pojects that were complete and occupied at the time of the traffic counts were not included as their trips would have been included in the existing intersection traffic volumes.

Notes: [1] Source - ITE Trip Generation Manual, 7th Ed, 2003. Equation-based rates were used where available, otherwise average trip rates were utilized.

Negative trip values indicate that redevelopment project is expected to generate fewer trips than the current lan uses on the site.

The routes people will use traveling to and from the related project sites was determined based on the patterns of existing area traffic for similar types of developments and on patterns listed in previous traffic studies for the area. The trips generated by the related projects were assigned to the area street system based on this directional distribution.

Improvements as part of Other Projects

One change to the existing street system that has been approved as part of another City Public Works project is the modification of the existing Long Beach Boulevard and 5th Street intersection. The intersection will be modified to allow full turning and through movements. The existing pedestrian traffic signal (located mid-block between 5th and 6th Streets) will be moved to this intersection to control vehicle and pedestrian movements. This change will allow for east-west through movement, as well as, left turn into and out of 5th Street from Long Beach Boulevard. This change has been included in the with- and without-project scenarios.

The proposed Shoreline Gateway project has been conditioned to install traffic signal at the intersections of Lime Avenue with 7th Street and 3rd Street. In addition, that project has proposed to remove the north approach of the Lime Avenue and Ocean Boulevard intersection and vacate the block of Lime Avenue between Ocean Boulevard and Medio Street.

Year 2015 Without-Project Traffic Operations

The projection of Year 2015 Without-Project traffic consists of existing traffic plus ambient traffic growth and traffic generated by the related projects, all of which were assumed to be completed by the Year 2015. The total Year 2015 Without-Project traffic volumes are illustrated in Figure 5. Based on these traffic forecasts, four intersections, two that are currently operating at LOS E or F, are projected to be operating at LOS E or LOS F. The four intersections are:

- Pine Avenue and Ocean Boulevard
- Alamitos Avenue and 7th Street
- Alamitos Avenue/Shoreline Drive and Ocean Boulevard
- Orange Avenue and Ocean Boulevard

The remaining intersections would operate at LOS D or better. Table 6 summarizes the capacity analysis results.

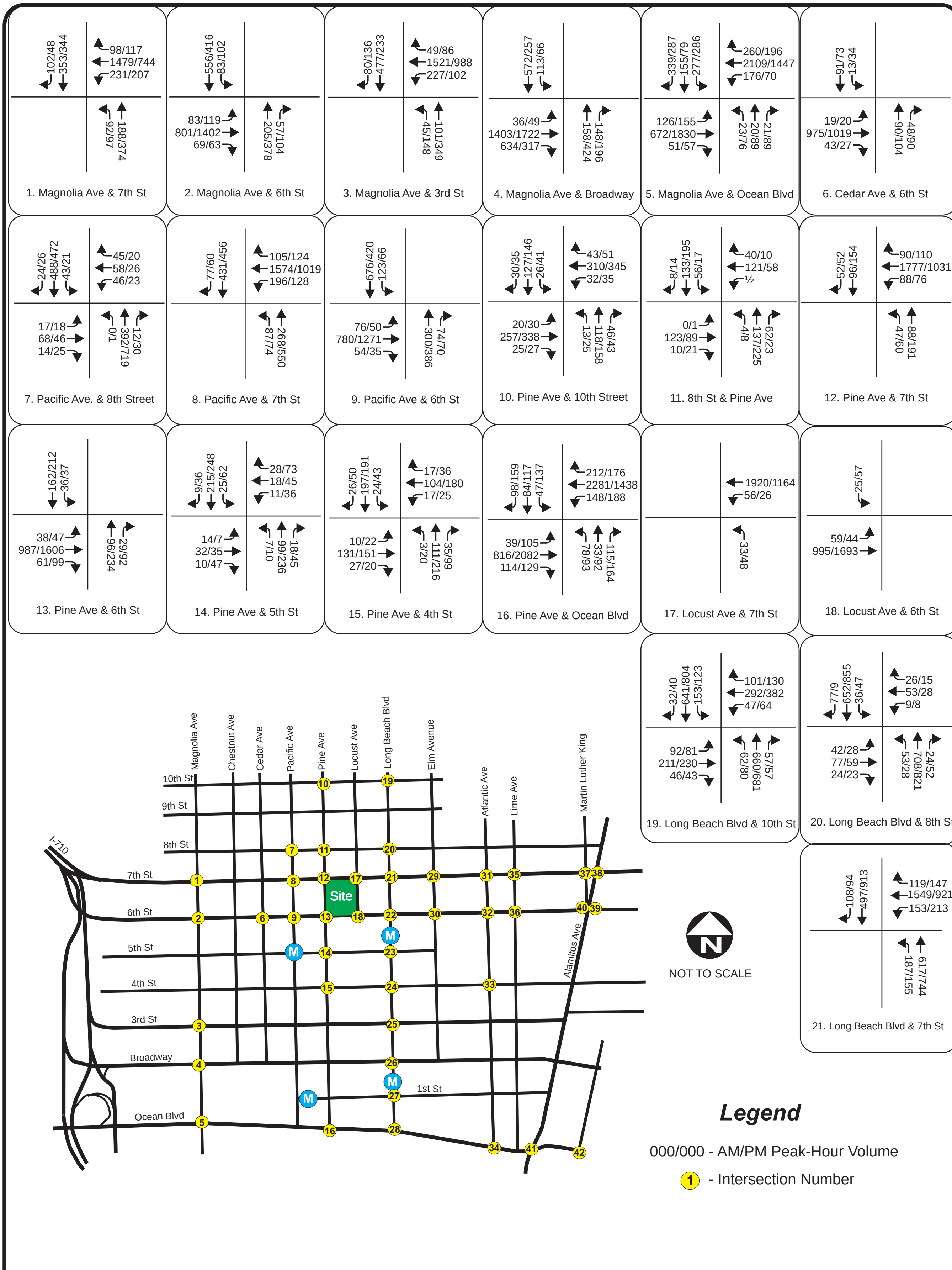

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FIGURE 5
2015 FUTURE WITHOUT PROJECT
PEAK-HOUR TRAFFIC VOLUMES

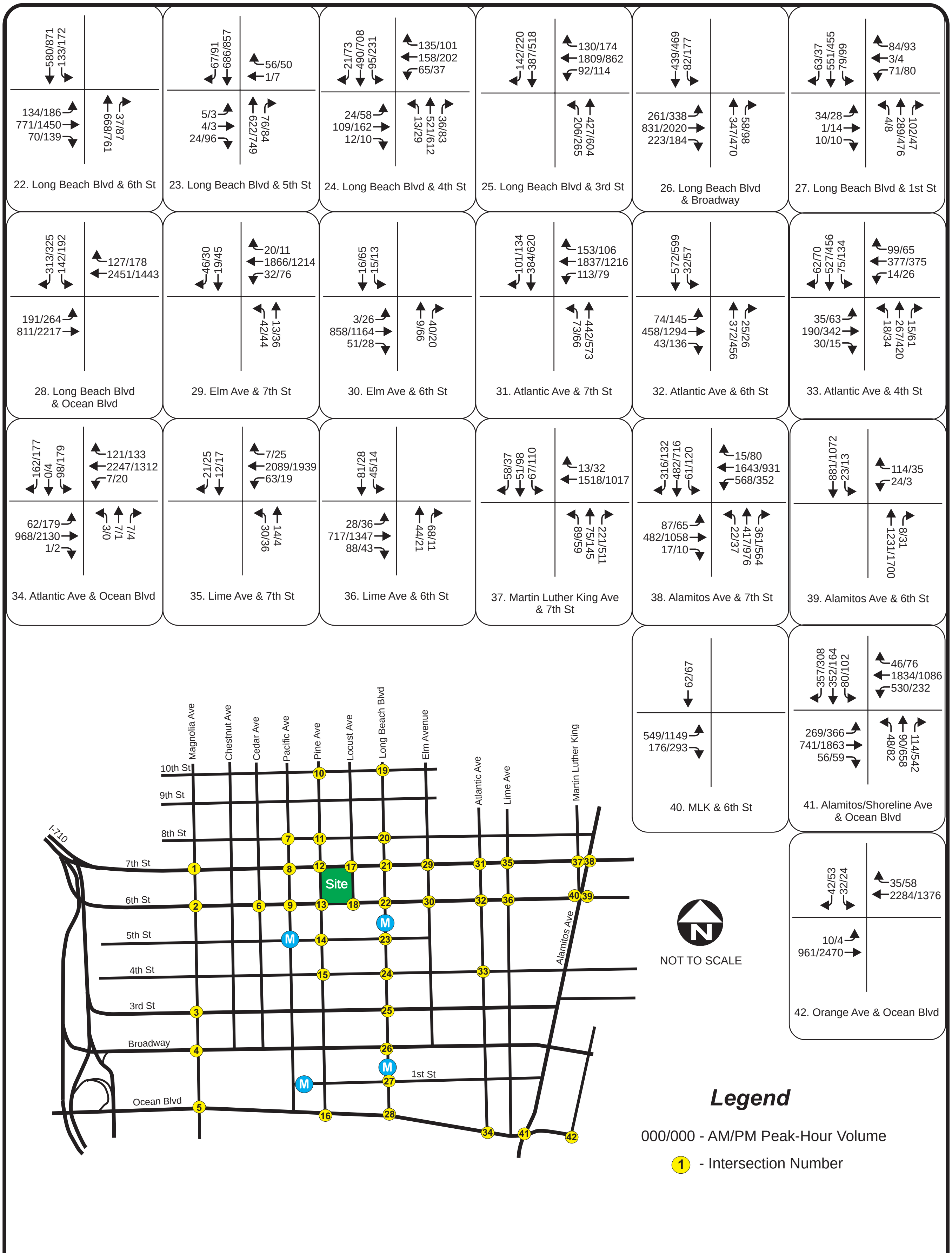

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FIGURE 5
2015 FUTURE WITHOUT PROJECT
PEAK-HOUR TRAFFIC VOLUMES

Table 6: YEAR 2015 – WITHOUT-PROJECT INTERSECTION CONDITIONS

Study Intersection		Year 2015 No Project					
		AM Peak			PM Peak		
		LOS	Del/Veh	V/C	LOS	Del/Veh	V/C
1	Magnolia Ave & 7th St	D		0.835	B		0.643
2	Magnolia Ave & 6th St	C		0.720	D		0.879
3	Magnolia Ave & 3rd St	C		0.733	B		0.610
4	Magnolia Ave & Broadway	C		0.756	C		0.749
5	Magnolia Ave & Ocean Blvd	D		0.860	D		0.814
6	Cedar Ave & 6th Street	A		0.472	A		0.535
7	Pacific Ave. & 8th Street	A		0.397	A		0.444
8	Pacific Ave & 7th St	C		0.721	A		0.585
9	Pacific Ave & 6th St	A		0.531	A		0.564
10	Pine Ave. & 10th Street	A		0.493	A		0.565
11	Pine Ave & 8th St	A		0.399	A		0.372
12	Pine Ave & 7th St	B		0.641	A		0.543
13	Pine Ave & 6th St	A		0.479	C		0.743
14	Pine Ave & 5th St	A		0.326	A		0.451
15	Pine Ave & 4th St	A		0.392	A		0.516
16	**Pine Ave & Ocean Blvd**	C		0.785	E		0.925
17	Locust Ave & 7th St	B		0.610	A		0.431
18	Locust Ave & 6th St	A		0.378	A		0.559
19	Long Beach Blvd & 10th St	B		0.668	B		0.677
20	Long Beach Blvd & 8th St	A		0.545	A		0.568
21	Long Beach Blvd & 7th St	C		0.774	C		0.718
22	Long Beach Blvd & 6th St	B		0.617	C		0.787
23	Long Beach Blvd & 5th St	A		0.406	A		0.505
24	Long Beach Blvd & 4th St	A		0.581	C		0.759
25	Long Beach Blvd & 3rd St	C		0.772	B		0.665
26	Long Beach Blvd & Broadway	A		0.495	D		0.825
27	Long Beach Blvd & 1st St	A		0.370	A		0.434
28	Long Beach Blvd & Ocean Blvd	D		0.882	C		0.709
29	Elm Ave & 7th St	A		0.578	A		0.463
30	Elm Ave & 6th St	A		0.357	A		0.432
31	Atlantic Ave & 7th St	C		0.775	C		0.712
32	Atlantic Ave & 6th St	A		0.457	B		0.656
33	Atlantic Ave & 4th St	B		0.655	B		0.676
34	Atlantic Ave & Ocean Blvd	C		0.769	B		0.702
35	Lime Ave & 7th St	B		0.650	A		0.583
36	Lime Ave & 6th St	A		0.402	A		0.453
37	Martin Luther King Ave & 7th S	C		0.741	C		0.754
38	**Alamitos Ave & 7th St**	E		0.982	F		1.153
39	Alamitos Ave & 6th St	B		0.638	C		0.716
40	MLK & 6th St	A		0.348	A		0.590
41	**Alamitos/Shoreline Ave & Ocean**	F		1.231	F		1.216
42	Orange Ave & Ocean Blvd	E		0.901	E		0.947

City of Long Beach Standards:
Signalized Intersection - ICU Methodology - Volume-to-Capacity Ratio (V/C)
Unsignalized Intersection - 2000 HCM Methodology - Delay per Vehicle (Del/Veh)

PRESS-TELEGRAM PROJECT DESCRIPTION

The Project involves the development of 542 residential units and 32,300 square feet of ground floor and basement commercial, office, and classroom space on an approximately 2.5-acre site in the City of Long Beach. The project site is located at 604 Pine Avenue, and encompasses one full downtown block bordered to the east by Locust Avenue, to the west by Pine Avenue, to the north by 7th Street and to the south by 6th Street, and bisected by Tribune Court, an alley. Approximately 1,186 on-site parking spaces would be provided in a new parking structure consisting of four above-ground levels and three below-ground levels. Vehicular access to the site would be taken from Locust Avenue and 7th Street. A building service access will also be provided off from 7th Street as shown Figure 6.

The non-residential space in the Press-Telegram building will be inhabited by Cal State University Long Beach (CSULB) and Arts Council for offices, classrooms, and exhibit space. The 8,000 square feet of space in the Meeker Bldg will be used for the work space for the Live/Work Units.

Project Traffic Generation

The first step in analyzing future traffic conditions with the Project is to estimate trip generation from the Project. Similar to the related projects in the previous chapter, the ITE Trip Generation rates were used to estimate future Project-related trips. For this analysis, it was assumed that all of the Project would be completed in a single phase by the Year 2015. Therefore no phasing analysis was completed. The Project is expected to generate approximately 190 new trips in the AM peak hour and 220 new trips in the PM peak hour as shown in Table 7. These trips represent the number of additional trips that will be generated above existing levels.

The existing employees from the Press-Telegram building will be relocated to the Arco Building located in the 400 West block of Ocean Boulevard. The employee traffic generated by the existing offices was relocated in the traffic assignment model to account for their relocation to that site. The traffic related to the existing restaurant use was removed from the area intersections and street system.

The existing trips for the Meeker Building were not subtracted from the area streets and intersections as it was difficult to determine the exact number of vehicles that were generated by the building. It was assumed that the building does not currently generate a significant volume of traffic during the weekday AM and PM peak hours. Since these volumes were not removed in the final calculations, the analysis presents a conservative estimate of conditions.

Figure 6: PRESS-TELEGRAM PROJECT SITE PLAN

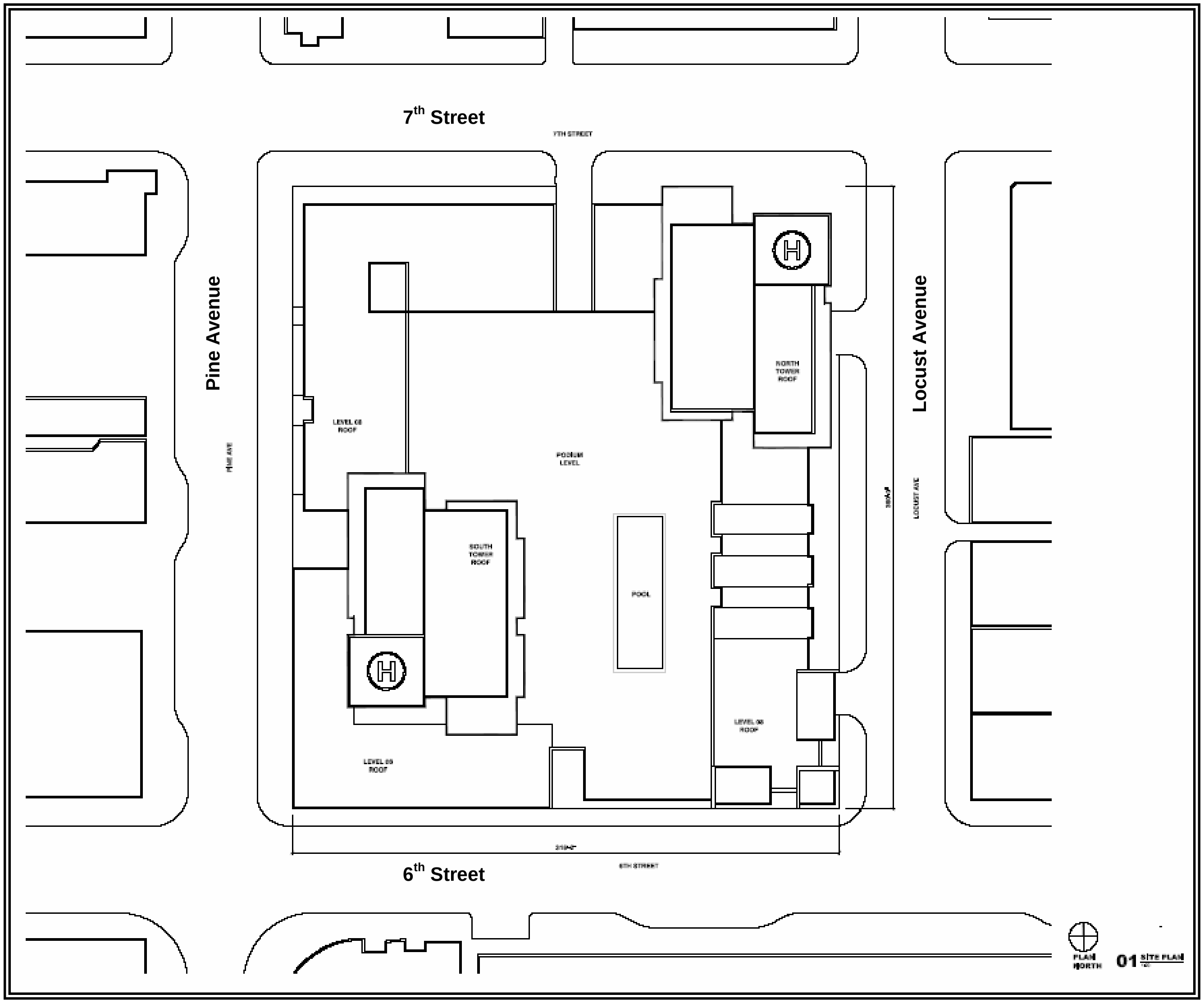

Table 7: PROJECT TRIP GENERATION

Land Use	Size	Units	ITE Code	Trips Ends Generated						
				AM Peak			PM Peak			Daily 24-Hour
				Total	In	Out	Total	In	Out	
Residential	542	DU	230	200	34	166	240	161	79	2,700
Non Auto Trips Reduction (-5%)				-10	-2	-8	-12	-8	-4	-135
Subtotal Residential				190	32	158	228	153	75	2565
CSULB Arts Council Office and Classrooms	24,300	SF	540	73	54	19	62	36	26	668
Non Auto Trips Reduction (0%)				0	0	0	0	0	0	0
Retail Subtotal				73	54	19	62	36	26	668
Existing Restaurant to be Removed										
Field Counts	1			-7	-4	-3	-7	-4	-3	-85*
Existing Office to be Relocated										
Field Counts	230	Emp		-66	-61	-5	-63	-18	-45	-485*
Subtotal				**190**	**21**	**169**	**220**	**167**	**53**	**2,663**

Source: Institute of Transportation Engineers, Trip Generation, 7th Edition
Notes:
1. ITE 230 - Condominiums/Townhouse. No specific trip generation was assumed for the work portion of the live-work units as no specific use has been identified.
2. SF - Square Feet; DU - Dwelling Units, Emp - Employees
3. CSULB and Arts Council use was assumed to operate similar to a specialty school or community college, so ITE land use 540 - Community College was used to estimate trips.
3. Exiting Traffic data based on driveway counts conducted at the site in June 2006.
* - Daily trips estimated based on ITE trip rates and AM and PM peak-period driveway counts.

Transit Trip Generation and Mode Assignment

Transit usage by the project residents and patrons is expected to be typical for this area of Downtown Long Beach because of the availability of bus and rail service in the area. Therefore, future transit usage rate was assumed to be about 3.5 percent of the overall development (or 5 percent of the residential development), which is the average for this area of Los Angeles County.

The projected future transit ridership for the Project was estimated based on the overall trip generation for the Project using the ITE rates and then multiplying that total trip generation by the 3.5 percent transit usage rate. This non-auto use factor was included in the trip assignments. This includes a reduction for transit and walking trips.

The assumptions and analyses used to determine the number of percentage trips assigned to transit were calculated using guidelines set forth in the 2004 Congestion Management Program for Los Angeles County. The total number of additional transit riders that the Project will create is projected to be approximately 10 in the AM peak hour and 11 in the PM peak hour. These projections are summarized in Table 8.

Table 8: NEW PROJECT TRANSIT TRIP GENERATION

	Total Trips	
Land Use	AM Peak Hour	PM Peak Hour
New Residential	200	240
New Office/Classroom	73	62
Existing Office	-66	-63
Existing Restaurant	-7	-7
Subtotal	200	232
Person-Trip Rate	1.4	1.4
Total Person Trips	280	325
3.5% Transit Use	3.50%	3.50%
New Transit Riders	10	11

Note: does not include riders from existing Meeker Building

Transit Facilities / Programs to Encourage Public Transit Usage and TDM Policies

To encourage the use of public transit and non-auto trip making, the Project will include transportation demand management (TDM) feature outlined in the City's TDM policies including, where appropriate, bicycle parking, safe bicycle access to streets and parking, efficient pedestrian access, and pedestrian-friendly access to area transit facilities. The City's Bicycle master Plan includes on-street bike lanes along Broadway, 3rd Street, Magnolia, Pacific Avenue, and Alamitos Avenue. In addition, bicycle parking facilities are proposed along several streets and the existing downtown "Bike Station" provides access to bicycles and service. All of the developments in the Project will be required to coordinate with area transit providers to accommodate and encourage transit use by residents and patrons. For non-residential occupants, appropriate programs and facilities will be included to encourage car and van pooling, provide information on transportation alternatives, and encourage trip reduction strategies in accordance with the City's TDM policies for non-residential development.

Project Trip Distribution

The routes people will use traveling to and from the Project were determined based on the patterns of existing area traffic for similar types of developments, patterns listed in previous traffic studies for the area, and on a select-zone analysis using the SCAG 2030 regional model for the downtown Long Beach area. For the Project, the trip assignment is primarily based on the residential component of the development as the retail/commercial components will serve predominantly local uses. The expected directional distribution of Project traffic is illustrated in Figure 7

Project Trip Assignment

The trips generated by the Project for the Year 2015 analysis periods were assigned to the area street system using the directional distribution described above. Because there are multiple access routes from the north, south, east, and west, the routes used for each user type in the project (resident, guest, patron, etc.) was considered depending on their access location. The overall project trip assignment is illustrated in Figure 8.

Threshold of Significance

Based on the City of Long Beach traffic Impact Guidelines, an impact is considered significant when the resulting level-of service with the project traffic is E or F and project related traffic contributes a V/C of 0.020 or more to the critical movements.

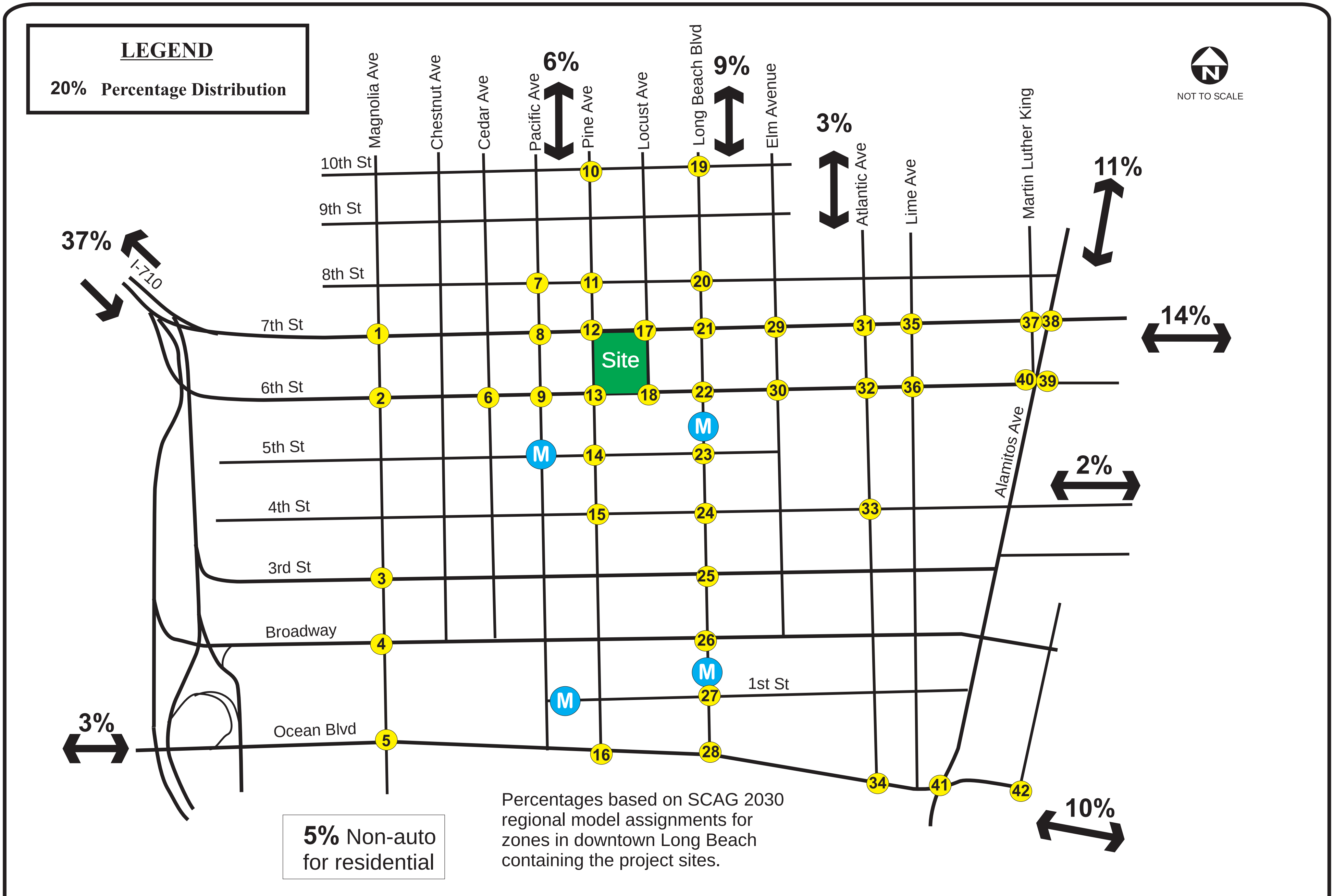

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FIGURE 7
PROJECT TRIP DISTRIBUTION

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FIGURE 8
YEAR 2015 PROJECT ONLY
PEAK-HOUR TRAFFIC VOLUMES

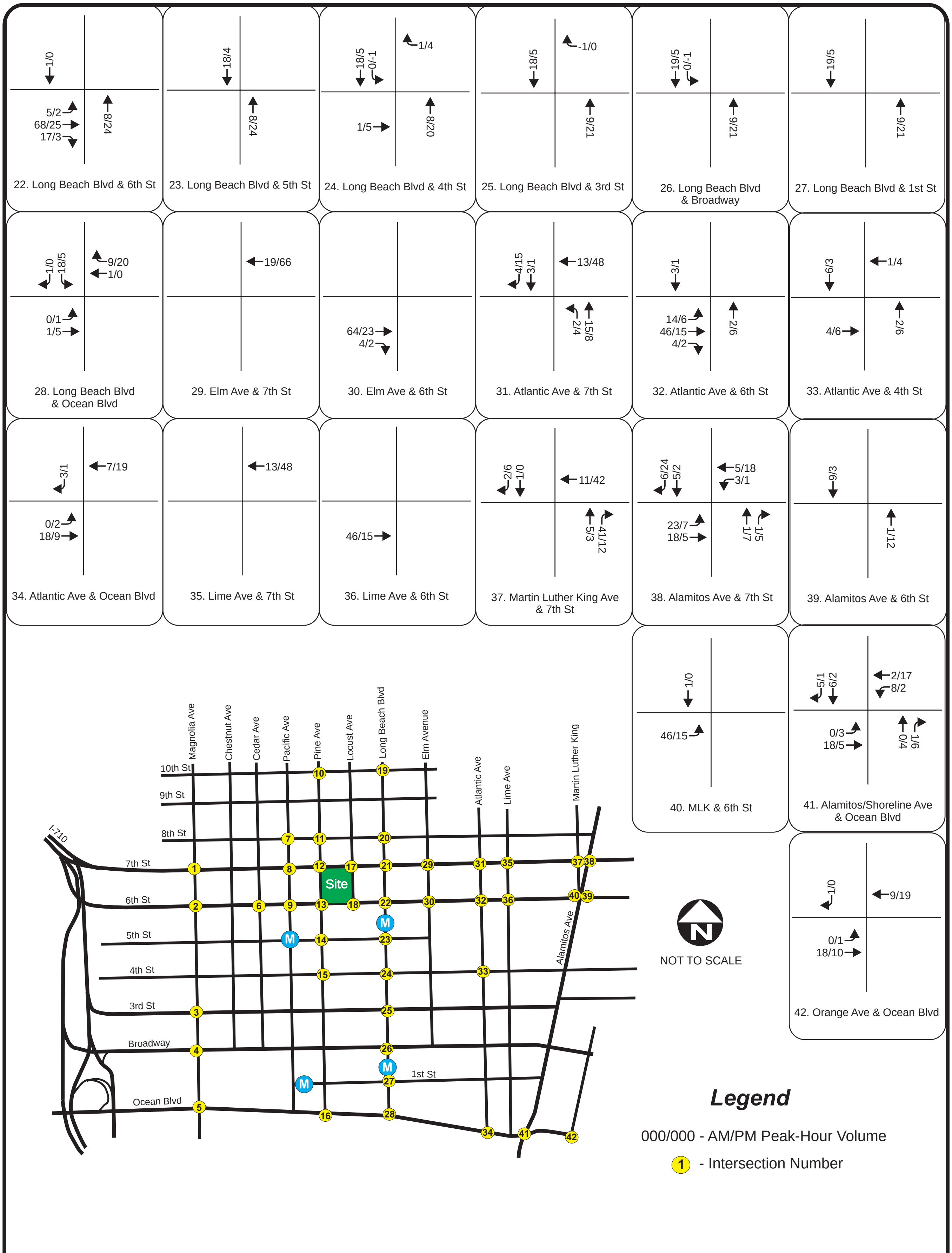

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FIGURE 8
YEAR 2015 PROJECT ONLY
PEAK-HOUR TRAFFIC VOLUMES

Year 2015 With-Project Traffic Operations

The total intersection volumes for the Year 2015 are illustrated in Figure 9. For the 2015 With-Project conditions, five study intersections are projected to be operating at LOS E or LOS F during one or both of the weekday peak hours. The five intersections that are projected to operate at LOS E and/or F are:

- Magnolia Avenue and 6th Street
- Pine Avenue and Ocean Boulevard
- Alamitos Avenue and 7th Street
- Alamitos/Shoreline and Ocean Blvd.
- Orange Avenue and Ocean Boulevard

In addition, peak hour operations at 4 intersections would operate at LOS D during one or both of the peak hours. The remaining intersections would operate at acceptable levels of service. Table 9 summarizes the level of service results.

Based on the City's significance criteria, the Project would have ***significant impact*** at the following study area signalized intersections:

- Magnolia Avenue and 6th Street

Expected Project Impacts on Current / Future Transit Services

Based on the projected additional ridership that will be generated by the Project and discussions with Long Beach Transit officials, there is not expected to be any significant impact on transit conditions in the area.

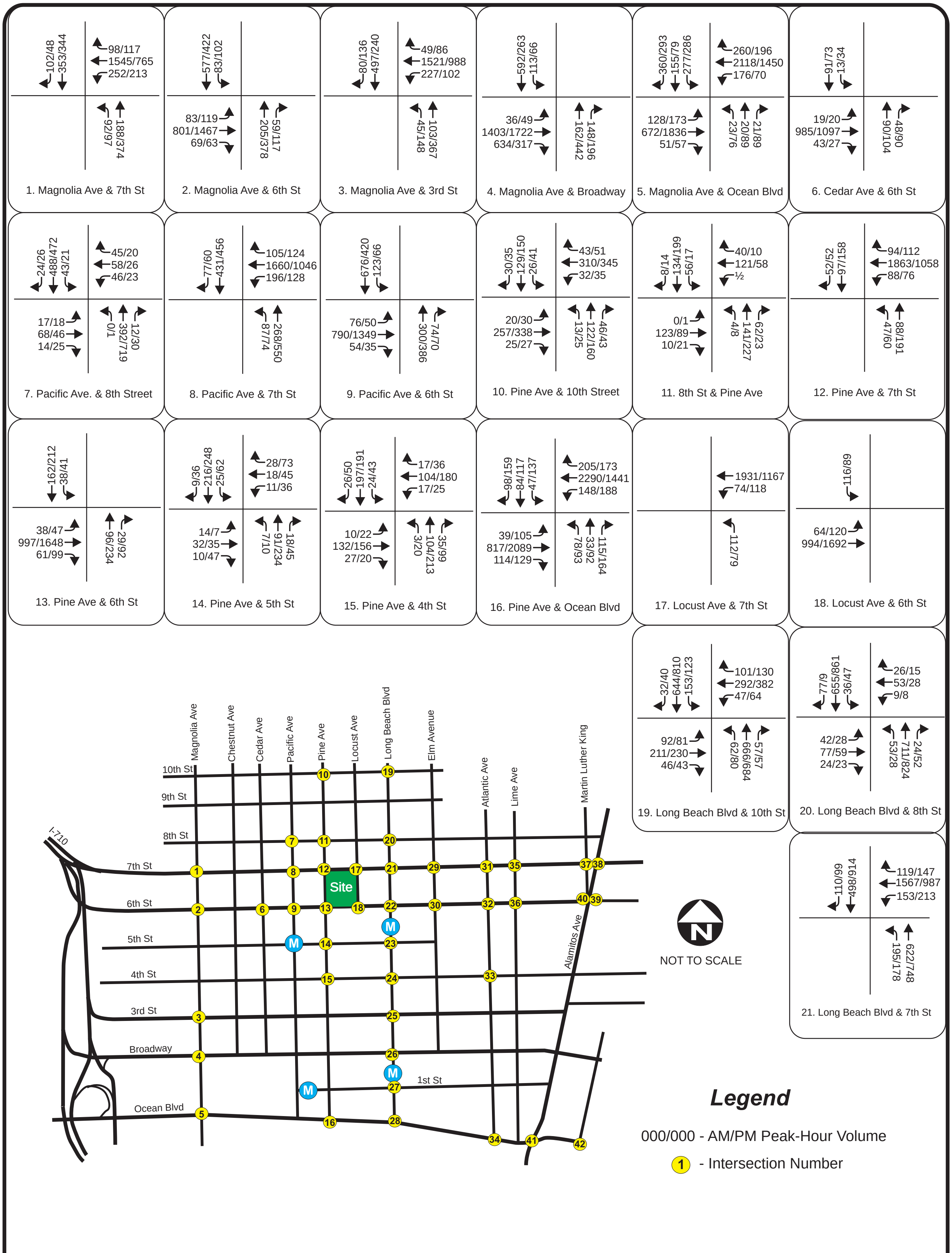

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FIGURE 9
2015 FUTURE WITH PROJECT
PEAK-HOUR TRAFFIC VOLUMES

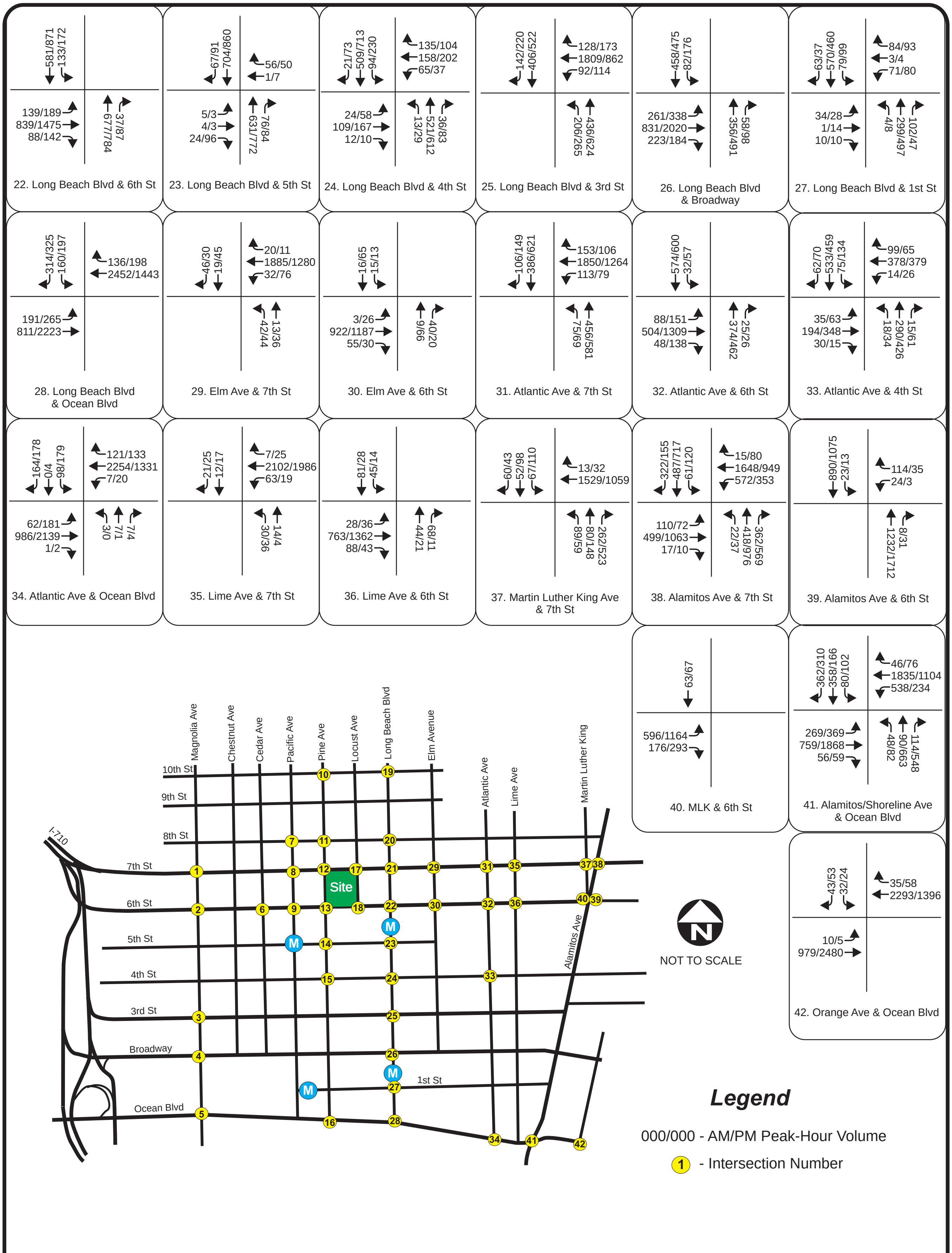

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FIGURE 9
2015 FUTURE WITH PROJECT
PEAK-HOUR TRAFFIC VOLUMES

Table 9: YEAR 2015 – WITH-PROJECT INTERSECTION OPERATING CONDITIONS

#	Study Intersection	AM Peak No Project LOS	AM Peak No Project Delay	AM Peak No Project V/C	AM Peak With Project LOS	AM Peak With Project Delay	AM Peak With Project V/C	AM Diff.	AM Impact - Yes / No ?	PM Peak No Project LOS	PM Peak No Project Delay	PM Peak No Project V/C	PM Peak With Project LOS	PM Peak With Project Delay	PM Peak With Project V/C	PM Diff.	PM Impact - Yes / No ?
1	**Magnolia Ave & 7th St**	D		0.835	D		0.855	0.020	No	B		0.643	B		0.649	0.006	No
2	Magnolia Ave & 6th St	C		0.720	C		0.736	0.016	No	D		0.879	E		0.903	0.024	**Yes**
3	Magnolia Ave & 3rd St	C		0.733	C		0.740	0.007	No	B		0.610	B		0.622	0.012	No
4	Magnolia Ave & Broadway	C		0.756	C		0.763	0.007	No	C		0.749	C		0.755	0.006	No
5	Magnolia Ave & Ocean Blvd	D		0.860	D		0.877	0.017	No	D		0.814	D		0.815	0.001	No
6	Cedar Ave & 6th Street	A		0.472	A		0.474	0.002	No	A		0.535	A		0.555	0.020	No
7	Pacific Ave. & 8th Street	A		0.397	A		0.397	0.000	No	A		0.444	A		0.444	0.000	No
8	Pacific Ave & 7th St	C		0.721	C		0.740	0.019	No	A		0.585	A		0.591	0.006	No
9	Pacific Ave & 6th St	A		0.531	A		0.534	0.003	No	A		0.564	A		0.581	0.017	No
10	Pine Ave. & 10th Street	A		0.493	A		0.496	0.003	No	A		0.565	A		0.566	0.001	No
11	Pine Ave & 8th St	A		0.399	A		0.402	0.003	No	A		0.372	A		0.374	0.002	No
12	Pine Ave & 7th St	B		0.641	B		0.661	0.020	No	A		0.543	A		0.552	0.009	No
13	Pine Ave & 6th St	A		0.479	A		0.483	0.004	No	C		0.743	C		0.761	0.018	No
14	Pine Ave & 5th St	A		0.326	A		0.326	0.000	No	A		0.451	A		0.453	0.002	No
15	Pine Ave & 4th St	A		0.392	A		0.392	0.000	No	A		0.516	A		0.514	-0.002	No
16	**Pine Ave & Ocean Blvd**	C		0.785	C		0.787	0.002	No	E		0.925	E		0.927	0.002	No
17	Locust Ave & 7th St	B		0.610	B		0.674	0.064	No	A		0.431	A		0.477	0.046	No
18	Locust Ave & 6th St	A		0.378	A		0.412	0.034	No	A		0.559	A		0.589	0.030	No
19	Long Beach Blvd & 10th St	B		0.668	B		0.671	0.003	No	B		0.677	B		0.686	0.009	No
20	Long Beach Blvd & 8th St	A		0.545	A		0.546	0.001	No	A		0.568	A		0.569	0.001	No
21	Long Beach Blvd & 7th St	C		0.774	C		0.784	0.010	No	C		0.718	C		0.747	0.029	No
22	Long Beach Blvd & 6th St	B		0.617	B		0.636	0.019	No	C		0.787	C		0.800	0.013	No
23	Long Beach Blvd & 5th St	A		0.406	A		0.412	0.006	No	A		0.505	A		0.506	0.001	No
24	Long Beach Blvd & 4th St	A		0.581	A		0.583	0.002	No	C		0.759	C		0.767	0.008	No
25	Long Beach Blvd & 3rd St	C		0.772	C		0.778	0.006	No	B		0.665	B		0.667	0.002	No
26	Long Beach Blvd & Broadway	A		0.495	A		0.505	0.010	No	D		0.825	D		0.832	0.007	No
27	Long Beach Blvd & 1st St	A		0.370	A		0.379	0.009	No	A		0.434	A		0.441	0.007	No
28	Long Beach Blvd & Ocean Blvd	D		0.882	D		0.883	0.001	No	C		0.709	C		0.711	0.002	No
29	Elm Ave & 7th St	A		0.578	A		0.582	0.004	No	A		0.463	A		0.477	0.014	No
30	Elm Ave & 6th St	A		0.357	A		0.372	0.015	No	A		0.432	A		0.438	0.006	No
31	Atlantic Ave & 7th St	C		0.775	C		0.782	0.007	No	C		0.712	C		0.730	0.018	No
32	Atlantic Ave & 6th St	A		0.457	A		0.473	0.016	No	B		0.656	B		0.661	0.005	No
33	Atlantic Ave & 4th St	B		0.655	B		0.658	0.003	No	B		0.676	B		0.681	0.005	No
34	Atlantic Ave & Ocean Blvd	C		0.769	C		0.772	0.003	No	C		0.702	C		0.704	0.002	No
35	Lime Ave & 7th St	B		0.650	B		0.653	0.003	No	A		0.583	A		0.593	0.010	No
36	Lime Ave & 6th St	A		0.402	A		0.412	0.010	No	A		0.453	A		0.457	0.004	No
37	Martin Luther King Ave & 7th S	C		0.741	C		0.746	0.005	No	C		0.754	C		0.773	0.019	No
38	**Alamitos Ave & 7th St**	E		0.982	E		0.999	0.017	No	F		1.153	F		1.158	0.005	No
39	Alamitos Ave & 6th St	B		0.638	B		0.638	0.000	No	C		0.716	C		0.720	0.004	No
40	MLK & 6th St	A		0.348	A		0.366	0.018	No	A		0.590	A		0.595	0.005	No
41	**Alamitos/Shoreline Ave & Ocean**	F		1.231	F		1.234	0.003	No	F		1.216	F		1.227	0.011	No
42	**Orange Ave & Ocean Blvd**	E		0.901	E		0.905	0.004	No	E		0.947	E		0.950	0.003	No

City of Long Beach Standards:
Signalized Intersection - ICU Methodology - Volume to Capacity Ratio
Unsignalized Intersection - 2000 HCM Methodology - Delay per Vehicle
Signalized Intersection Impact Criteria and Threshold:
LOS E or F with the Project and an increase in V/C of 0.02 or greater.

Congestion Management Program System Analysis

The Congestion Management Program (CMP) was created statewide as a result of Proposition 111 and has been implemented locally by the Los Angeles County Metropolitan Transportation Authority (LACMTA). The CMP for Los Angeles County requires that the traffic impact of individual development projects of potential regional significance be analyzed. A specific system of arterial roadways plus all freeways comprise the CMP system. A total of 164 intersections are identified for monitoring on the system in Los Angeles County. This section describes the analysis of project-related impacts on the CMP system. The analysis has been conducted according to the guidelines set forth in the 2002 Congestion Management Program for Los Angeles County.

CMP Intersection Analysis

The intersections of Alamitos Avenue with 7th Street and with Ocean Boulevard are the only study area intersections that are part of the CMP Arterial monitoring locations. For purposes of the CMP, a significant impact occurs when the proposed project increases traffic demand on a CMP facility by two percent of capacity ($V/C \geq 0.02$), causing LOS F ($V/C > 1.00$). If the facility is already at LOS F, a significant impact occurs when the proposed project increases traffic demand on a CMP facility by two percent of capacity ($V/C \geq 0.02$). The results of the capacity analysis indicate that the project will increase demand at the Alamitos Avenue and 7th Street intersection by two percent (0.02) or more. Therefore, the project will have a significant CMP impact at that intersection.

Discussions conducted with City staff along with other ongoing analysis of this location indicate that there are no feasible physical measures that could be developed at either intersection that would mitigate the Project's impact at this intersection. Therefore, the impact at this intersection would be considered significant and unavoidable.

CMP Mainline Freeway Segment Analysis

The focus of this analysis is to determine whether project related trips would significantly impact the freeway system according to CMP guidelines and threshold of significance. For purposes of analyzing the mainline freeway impact of the project, the nearest freeway monitoring station is located along the I-710 Freeway. Table 11 summarizes the project added trips by time period, direction and location. The project added trips were compared with CMP Traffic Impact Analysis guidelines to determine if additional traffic impact analysis is needed at the freeway monitoring station.

As shown in Table 11, the proposed project does not contribute more than minimum threshold of 150 peak-period trips at any CMP mainline location. Based on CMP criteria described previously, detailed impact analysis is not warranted.

Table 11: PROJECT ADDED TRIPS AT FREEWAY MONITORING STATIONS

Freeway Analysis Segment	Project Added Trips by Direction		Traffic Impact Analysis Required?	
	NB	SB	NB	SB
Weekday AM Peak Hour				
I-710 Freeway south of Anaheim Street	64	30	No	No
Weekday PM Peak Hour				
I-710 Freeway south of Anaheim Street	36	68	No	No

Cumulative Mitigation Measures

Regional programs such as the Long Range Transportation Plan (LRTP) prepared by the Los Angeles County Metropolitan Transportation Authority (MTA), the Regional Transportation Plan (RTP), the Regional Transportation Improvement Plan (RTIP) prepared by the Southern California Association of Governments (SCAG), and the Statewide Transportation Improvement Plan (STIP) prepared by the California Department of Transportation (Caltrans) are all intended to address the cumulative mobility needs of Los Angeles County. The LRTP recommends HOV, transit, and demand management improvements and identified funding sources and implementation schedules. The RTP forecasts long-range transportation demands for the five-county SCAG region and identifies policies, actions, and funding sources to accommodate these demands, including construction of new transportation facilities, transportation system management strategies, transportation demand management strategies, and land use strategies. The RTP and STIP are programming documents listing all of the funded/programmed regional improvements.

Additional measures to address significant cumulative conditions are beyond the ability of any individual project to implement and, as such, the Project’s incremental impacts on poor cumulative conditions would be considered significant and unavoidable.

Project Parking Analysis

An analysis of the Project’s project parking supply and demand was completed to determine whether the Project will have sufficient parking. The Project is proposing to provide up to 1,186 parking spaces. The current Long Beach parking code requires 1.5 to 2 parking spaces per residential units plus 1 guest parking space for every 4 units. In addition, the Project would be required to provide up to 5 spaces for every 1,000 square feet of commercial space, 4 spaces per 1,000 square feet for the office uses, and 20 spaces per 1,000 square feet for the classroom space. The City’s parking code does not specifically address the gallery space. However, for the purposes of calculating the shared parking demand, the analysis has used 4 spaces per 1,000 square feet as the assumed peak parking demand.

With the parking demand for each use calculated as a stand alone element of the development, the site would require 1,390 spaces assuming the parking rates above. This would result in a parking shortage of 204 spaces, as listed Table 12. This would require that a standards variance be requested to allow for less than the required number of parking spaces.

To minimize the number of students that may park in the area neighborhoods to avoid a parking charge, the project should provide free parking to students attending classes at the site. This could be done through either a validation program or prepaid parking passes.

The project applicant shall complete a parking demand study, including a shared parking analysis, after a class program is defined in order to determine whether the amount of parking proposed is sufficient to adequately accommodate the anticipated demand. The results of the analysis shall be subject to the review and approval of the City traffic engineer. If the parking demand study determines that the parking proposed for the project would be sufficient, a variance shall be requested in accordance with the City's Zoning Regulations. However, if the study determines that parking would be insufficient or the variance request is denied, the project shall meet the City's parking requirements, in accordance with the Zoning Regulations.

Table 12: PARKING REQUIREMENTS

Land Use	***Size***	***Units***	***Rate***	***Required Spaces***
Without Shared parking				
Residential				
Studio and one bedroom	73	D.U.'s	1.5 per unit	110
	290	D.U.'s	2 per unit	580
Two or more bedrooms	179	D.U.'s	2 per unit	358
Guest Parking	542	D.U.'s	0.25 per unit	136
Live-Work Commercial	8,048	000's S.F	5 per 1,000 s.f.	41
Residential Subtotal				1,225
Office	16.3	000's S.F	4 per 1,000 s.f.	65
Classroom	4.0	000's S.F	20 per 1,000 s.f.	80
Gallery/Exhibit Space	4.9	000's S.F	4 per 1,000 s.f.	20
Demand Total				1,390
Supply				1,186
Parking Shortage				***(204)***

TRANSPORTATION SYSTEM IMPROVEMENT RECOMMENDATIONS

Improvements to the area transportation system are proposed as part of the Project and as part of other area projects previously approved by the City of Long Beach. The following discusses these improvements and proposed project mitigation measures.

Previously Committed Improvements

One change to the existing street system that has been approved as part of another City Public Works project is the modification of the existing Long Beach Boulevard and 5th Street intersection. The intersection will be modified to allow full turning and through movements. The existing pedestrian traffic signal (located mid-block between 5th and 6th Streets) will be moved to this intersection to control vehicle and pedestrian movements. This change will allow for east-west through movement, as well as, left turn into and out of 5th Street from Long Beach Boulevard. This change has been included in the with- and without-project scenarios.

As part of the improvements committed to the Shoreline Gateway project, the intersections of Lime Avenue with 7th Street and 3rd Street will be signalized.

Project Improvements

With the completion of these and other redevelopment projects in the downtown and Central area of the City, the capacity of the street system will become more intensely utilized. In 2005, only 3 of the 42 intersections are operating at LOS D or worse. In 2015, 9 intersections are expected to be operating at those levels. As the system's capacity is utilized, it will become more and more important to manage the street system in a more efficient and coordinated manner.

Locust Avenue/7th Street Intersection

This intersection has a significant amount of vehicle and pedestrian traffic during the school year as many parent pick-up and drop off children at or near the intersection. In addition, during the school year, the north leg of the intersection is closed during school hours. The Project will have traffic utilizing this intersection as one the primary access location for the site. The traffic signals today are adequate for relatively low volume of traffic that uses Locust Street. To accommodate future increases in traffic and provide more responsive operations for the intersection and the corridor, the existing traffic signals must be modernized with improved signal heads and pedestrian indicators and signal poles that meet current safety and design standards.

Locust Avenue/6th Street Intersection

The Project will have traffic utilizing this intersection as one the primary access location for the site. The traffic signals today are adequate for relatively low volume of traffic that uses Locust Street. To accommodate future increases in traffic and provide more responsive operations for the intersection and the corridor, the existing traffic signals must be modernized with improved signal heads and pedestrian indicators and signal poles that meet current safety and design standards.

Pine Avenue/7th Street Intersection

Several bus routes travel through this intersection, located at the northwest corner of the project, as they turn from westbound 7th Street to southbound Pine Avenue to access the downtown area. The intersection is narrow with small radiuses on the corners. Currently, if cars are waiting to make a northbound-to-westbound left-turn at the intersection, buses trying to make the westbound-to-southbound left turn have difficulty completing the turn because of the narrow lanes and small radiuses at the corner of the intersection. To improve this condition for buses, the curb radius on the southwest corner of the intersection should be increased to provide a wider approach for turning vehicles.

Magnolia Avenue/6th Street Intersection

The project contributes a significant impact at this intersection by adding traffic to several of the approaches. This traffic increase results in approximately a 2.4 percent increase in the intersection's V/C ratio to 0.903 during the PM peak hour. To mitigate the project's impact, the change in the V/C ratio needs to be reduced by a minimum of 0.003. If the V/C ratio were reduced to 0.900, the LOS would be D and the project's impact would not be considered significant. This reduction could be accomplished by reducing the size of the project's trip generation by about eight percent or by adding either an eastbound turn lane or a northbound right-turn lane. If a turn lane were added to any of the approaches some on-street parking would need to be removed. Any turn lane addition would result in the loss of approximately 4 parking spaces. Given the already limited supply of on-street parking in the area, the loss of parking may not be considered acceptable, especially given the small V/C change needed to eliminate the Project's impact.

Travel demand management (TDM) programs should be provided for the office and school programs to encourage employees and students to use transit and other trip reduction strategies to reduce the traffic impacts of the Project. If traffic volume reduction or geometric solution is not implemented, then the Project's impact would be considered significant and unavoidable.

Parking Mitigation and Management

The City has been monitoring downtown parking conditions for several years to identify any projected shortages and develop management strategies for addressing parking the parking supply and demand. While the areas adjacent to the Project sites are served by several parking facilities, the majority of the available public parking is located in the City Place garages. Long-term projections indicate that parking will need to be added to the area to accommodate future demand. Recent surveys show that while parking demand during the weekday has stabilized, the demand during the weekend has increased. The Project should be self-parked and provide parking for expected tenants and residents within the site. Some guest and patron parking can be accommodated in the area public supply.

In addition to monitoring parking usage in the downtown to manage the supply side, the City is also evaluating alternatives for managing parking demand at downtown facilities through a system of changeable message signs and video monitoring to identify available parking spaces and direct motorists to available facilities through a coordinated management system. In addition, through its TDM program the City continually encourages developments and businesses to provide alternatives to auto travel, and parking demand, in the downtown.

Year 2015 Mitigation Measures

The Project will contribute to significant impacts at the intersection of Magnolia Avenue and 6th Street. At the intersection of Magnolia Avenue and 6th Street, the intersection is physically constrained with existing developments located close to the street making expansion of the roadway cross-section difficult. The projects impact can be mitigated through the addition of a turn lane for either of the eastbound turning movements or the northbound right-turn movement. A summary of the operating conditions with the turn lane mitigation is listed in Table 13. If a geometric improvement is determined to not be desirable or feasible at this intersection, operational improvements or policy-based changes may be implemented to improve overall traffic conditions, but will not affect the volume-to-capacity calculation on which the impact criteria are based. Therefore, if no geometric change is implemented or the project's traffic generation is not reduced then the impact at this intersection would be considered significant and unavoidable.

Table 13: YEAR 2015 – WITH-PROJECT INTERSECTION OPERATING CONDITIONS WITH MITIGATION

	AM Peak Hour				PM Peak Hour			
	w/o Mitigation		w/ Mitigation		w/o Mitigation		w/ Mitigation	
Intersection	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
Magnolia Ave & 6th St	C	0.736			E	0.903		
With NB Right-Turn Lane			C	0.736			D	0.821
With EB Right-Turn Lane			C	0.720			D	0.888
With EB Left-Turn Lane			C	0.717			D	0.875

*Note: * denotes delay value, others are volume-to-capacity ratios*

To mitigate and address the Project's impacts and address other operational and safety concerns in the site immediate area, the following measures are proposed:

<u>Locust Avenue/7th Street Intersection</u>
To improve traffic operations and safety at this intersection, the applicant will be responsible to modernize the traffic signal to current City standards per the direction of the City Traffic Engineer.

<u>Locust Avenue/6th Street Intersection</u>
To improve traffic operations and safety at this intersection, the applicant will be responsible to modernize the traffic signal to current City standards per the direction of the City Traffic Engineer.

<u>Pine Avenue/7th Street Intersection</u>
The improve traffic operations at this intersection, the Project will be required to modify the southwest corner of the intersection per the direction of the City Traffic Engineer.

Magnolia Avenue/6th Street

The project contributes a significant impact at this intersection by adding traffic to several of the approaches. To mitigate the project's impact, the Project will be required to either add an eastbound turn lane or a northbound right-turn lane or reduce the project trip generation by approximately eight percent. Any physical modifications to the intersection will require the prior approval of City Traffic Engineer. If traffic volume reduction or geometric solution is not implemented, then the Project's impact would be considered significant and unavoidable.

Traffic Monitoring

The applicant will provide to the satisfaction of the City Traffic Engineer two rooftop pan/tilt/zoom cameras and communications with power and control capability to the Department of Public Works to monitor real-time traffic operations along the Pine Avenue, 6th Street, and 7th Street corridors. One camera will be located on top of the building tower located closest to one of the Pine Avenue intersections, while the other will be located closest to one of the Locust Avenue intersections.

Proposed Parking Mitigation Measures

Prior to site plan approval, the project applicant shall complete a parking demand study, including a shared parking analysis, after a class program is defined in order to determine whether the amount of parking proposed is sufficient to adequately accommodate the anticipated demand. The results of the analysis shall be subject to the review and approval of the City traffic engineer. If the parking demand study determines that the parking proposed for the project would be sufficient, a variance shall be requested in accordance with the City's Zoning Regulations. However, if the study determines that parking would be insufficient or the variance request is denied, the project shall meet the City's parking requirements, in accordance with the Zoning Regulations.

As proposed, the project can set aside no more than 35 parking spaces for reserved use by non-residential parkers. In addition, all student parking for the CSULB uses shall be free to students to minimize the number of students that way want to parking along the area curbfronts in the adjacent residential areas.

Proposed Transit Mitigation Measures

Discussions with Long Beach Transit officials indicated that no system improvements should be required for the Project. However, they will monitor conditions and adjust/coordinate services as needed in the future to address changes in demand.

To encourage the use of public transit and non-auto trip making, the Project will include transportation demand management (TDM) feature outlined in the City's TDM policies including, where appropriate, bicycle parking, safe bicycle access to streets and parking, efficient pedestrian access, and pedestrian-friendly access to area transit facilities. The City's Bicycle master Plan includes on-street bike lanes along Broadway and 3rd Street. In addition, bicycle parking facilities are proposed along several streets and the existing downtown "Bike Station" provides access to bicycles and service. All of the developments in the Project will be required to coordinate with area transit providers to accommodate and encourage transit use by residents and patrons. For non-residential sites, appropriate programs and facilities will be included to encourage car and van pooling, provide information on transportation alternatives, and encourage trip reduction strategies in accordance with the City's TDM policies for non-residential development.

Appendix G

Water Availability Assessment

LONG BEACH WATER DEPARTMENT
The Standard in Water Conservation & Environmental Stewardship

Water Availability Assessment

prepared for the

Press-Telegram Mixed Use Development

Long Beach, California

Prepared by the

Long Beach Water Department

June 1, 2006

Table of Contents

I. FINDINGS

The Press-Telegram Mixed Use Development ("Project") is exempt from the SB 221 requirement of an affirmative written verification of sufficient water supply (Government Code 66473.7) because it will be sited within an urbanized area that has been previously developed for urban uses. The Project is further exempt from SB 221 requirements because the immediate contiguous properties surrounding the proposed Project site are, or previously have been, developed for urban uses.

The Project is subject to the water assessment required by SB 610. LBWD anticipates that it can provide sufficient domestic water supply to accommodate the Project. The projected water demand of the Project is within the 20-year water demand growth projected by LBWD's current adopted 2005 Urban Water Management Plan (UWMP).

LBWD anticipates that its projected water supplies available during normal, single-dry, and multiple-dry water years as included in the 20-year projection contained in this assessment will meet the projected water demand associated with the Project, in addition to the existing and other planned future uses of LBWD's system.

II.BACKGROUND

A. SB 221 & SB 610 BACKGROUND

Effective January 1, 2002, California Senate Bill 221 and Senate Bill 610 amended Section 21151.9 of the Public Resources Code and Sections 10631, 10656, 10910-12, 10915 of the Water Code and Section 11010 of the Business and Professions Codes, and Sections 65867.5 of the Government Code as well as adding Sections 66455.3 and 66473.7 to the Government Code. The Senate Bills were designed to improve the link between information on water supply availability and certain land use decisions made by cities and counties. SB 221 and SB 610 are companion measures which seek to promote more collaborative planning between local water suppliers and cities and counties. Both statutes require detailed information regarding water availability to be provided to the city and county decision-makers prior to approval of specified large development projects. Both statutes also require this detailed information to be included in the administrative record that serves as the evidentiary basis for an approval action by the city or county on such projects. Both measures recognize local control and decision making regarding the availability of water approval of the projects.

SB 221 conditions approval by a city or county of certain residential subdivisions on an affirmative written verification of sufficient water supply. SB 610 requires a water assessment to be furnished to local governments for inclusion in any environmental documentation for certain projects (as defined in Water Code 10912(a)) subject to the California Environmental Quality Act.

The Long Beach Water Department (LBWD) has prepared this water supply verification and availability assessment for the proposed Project in Long Beach, California, at the request of Ms. Angela Reynolds, AICP, Environmental Officer, City of Long Beach, Department of Planning and Building (see Appendix). The LBWD is the public water agency that will service the Project.

B. GOVERNING BODY APPROVAL REQUIRED

If the assessment concludes that the supply is sufficient, the water supply governing body must approve the assessment and deliver it to the lead agency (per Water Code section 10910(g)(1):

> *(g)(1) ...the governing body of each public water system shall submit the assessment to the city or county no later than 90 days from the date on which the request was received. The governing body of each public water system...shall approve the assessment prepared pursuant to this section at a regular or special meeting.*

LBWD received the request for an assessment of the Project on May 10, 2006 (see appendix). LBWD must provide the approved assessment within 90 days.

C. PRESS-TELEGRAM MIXED USE DEVELOPMENT IS DEFINED AS A SUBJECT "PROJECT"

Although SB 221 defines the Project as a "subdivision," as defined by SB221's Government Code 66473.7(a)(1), as having more than 500 units when the public water system (LBWD) has more than 5,000 services, the Project is exempt from SB 221 requirement of an affirmative written verification of sufficient water supply (Government

Code 66473.7) because it will be sited within an urbanized area that has been previously developed for urban uses. The Project is further exempt from SB 221 requirements because the immediate contiguous properties surrounding the proposed Project site are, or previously have been, developed for urban uses.

A development is defined as a "project" by Water Code 10912(a) and (b) if it meets any of the following, in Table 1, below.

Table 1 - SB 610 Criteria

What qualifies as a 'project' under SB 610

	SB 610 Threshold		Dwelling Unit' Equivalents	
SFR or MFR	500	dwelling units		
Shopping center or business				
	1,000	employees	2.0	employees = 1 DU
or	500,000	sf of floor space	1,000	sf = 1 DU
Commercial office building:				
	1,000	employees	2.0	employees = 1 DU
or	250,000	sf of floor space	500	sf = 1 DU
Hotel or motel	500	rooms	1.0	room = 1 DU
Industrial, manufacturing, or processing plant, or industrial park				
	1,000	persons	2.0	persons = 1 DU
or	650,000	sf of floor space	1,300	sf = 1 DU
or	40	acres of land	0.080	acres = 1 DU
A mixed-use project that includes one or more of the projects specified above				
A project that would demand an amount of water equivalent to, or greater than the amount of water required by a 500 dwelling unit project.				

The Project is described as follows:

> "The project proposal calls for construction of 542 residential units in two high-rise towers. A four- to eight story podium would

surround both towers and the general perimeter of the site. Both towers would be 22 stories and 250 feet in height. The Project would also include 13,000 square feet of ground floor commercial space and 1,084 on-site parking spaces in a new parking structure consisting of four above-ground levels and three subterranean levels. The approximately 2.5 acre project site is located at 604 Pine Avenue and encompasses one full downtown block..." (page 1, Notice of Preparation of Draft Environmental Impact Report, dated 3/29/06.)

Therefore, the Press-Telegram Mixed Use Development is both subject to CEQA and defined as a "project" by Water Code 10912(a) and (b) (see Table 1, below).

D. LBWD IS THE RESPONSIBLE AGENCY FOR PREPARING SB 610 ASSESSMENT

Because LBWD will provide domestic water to the site and because LBWD is a public water system of over 3,000 service connections, LBWD is responsible for performing the SB 610 assessment.

E. AN SB 610 WATER SUPPLY ASSESSMENT HAS NOT PREVIOUSLY BEEN PERFORMED FOR THE PROJECT

Because an SB 610 assessment has not previously been performed on the Project, one must be prepared within 90 days of a request for an assessment.

F. LBWD HAS A CURRENT ADOPTED UWMP

If the public water system has a current adopted Urban Water Management Plan (UWMP), it may rely on data in the plan for much of the information required in the SB 610 assessment. UWMPs are completed every five years, the last plan being completed by LBWD in 2005. Therefore, LBWD has a current adopted 2005 UWMP and used the data from that plan in this assessment.

G. PROJECT'S PROJECTED DEMAND FOR WATER

Table 2 estimates Project's water use. This estimate is based on the eventual build-out of the project. The estimate shows the "Expected Water Use" and, because the Project will be replacing existing urban users of water, this table also shows the "Net Increase in Water Use", which is the difference between the Project's water demand and the existing demand.

Table 2 – Project's Water Demand

Estimate of Project's Annual Water Demand

Land Use	Millions of Square Feet	Dwelling Units	Demand Factors AF / Unit / Yr			Project Demand		
DWR		*500*	*0.50*		*per DU*	*250.0*	*af/yr*	% of
*Assumption***		*500*	*0.30*		*per DU*	*150.0*	*af/yr*	Total
Single-Family Housing		-	0.301	*	per DU	0.0	af/yr	0%
Multiple-Family Dwelling Units		542	0.249	*	per DU	135.0	af/yr	98%
Hotels/ Motels		-	0.143	^	per DU	0.0	af/yr	0%
Commercial/ Retail Uses	0.013		224	~	per 1 mil SF	2.9	af/yr	2%
Office Uses	-		224		per 1 mil SF	0.0	af/yr	0%

Expected Water Use	137.9	af/yr	af/yr
Annual previous water use (average of CY 2004 & CY 2005)	-4.9	af/yr	af/yr
Net Increase in Water Use	133.0	af/yr	af/yr

* Based on average use in Long Beach.
^ Based on average use of large hotels in Long Beach.
~ Based on LBWD Compreshensive Sewer System Master Plan and Management Prograi

** "Note: In determining whether a project would demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit project, it is generally acknowledged that one acre-foot of water can serve two to three households on an annual basis; therefore, one dwelling unit typically consumes .3 to .5 acre-feet of water per year, depending upon several factors, including the regional climate." (DWR Handbook, page 3).

H. PROJECTED WATER DEMAND FOR THE PROJECT WAS ACCOUNTED FOR IN THE MOST RECENT UWMP.

If the projected water demand from the Project is accounted for in the current adopted UWMP, then the UWMP may be used in the water supply assessment. LBWD does not articulate specific development projects in its UWMP; but LBWD anticipates their demand for water through projected increases in factors influencing demand projections, such as increases in housing, population, and employment. The current adopted UWMP projected water demands based on a number of factors, including an increase in multi-family housing from 89,703 units in 2005 to 112,716 units by 2030, or a total increase of 23,013 units.

Ninety-eighty percent of the demand of the Project will be from multi-family units, the balance from commercial space. The Project, then, by adding 542 units, accounts for just a fraction of the new water demand from multi-family housing accounted for in the most recent adopted UWMP.

The current UWMP water demand projections took growth in commercial/retail square footage into consideration, indirectly, by projecting an increase in water demand based on an increase in total employment, projecting an increase from 200,200 in 2005 to 244,400 jobs by 2030, an increase of 44,200 jobs. The water demand from the Project's commercial space, about three (2.9) acre-feet, represents the demand of approximately nine (9) single-family dwelling units, also easily within the demand projections of the most recent UWMP.

It should also be noted that the water demand from the previous use of the Project site was approximately five (4.9) acre-feet per year; that is, not all the water demand of the Project will be new demand on the system.

III. WATER DEMAND, SUPPLY AND RELIABILITY

LBWD's total projected water supplies and demands during normal, single dry, and multiple dry water years during a 20-year projection meet the projected water demand of the Project, in addition to LBWD's existing and planned future uses, including agricultural and manufacturing uses. LBWD's water supply and demand projections are documented in its 2005 UWMP, which is incorporated into this analysis by reference.

LBWD water supplies have been documented in its 2005 UWMP. The following is in addition to that of the UWMP. The demand for domestic water in Long Beach is met with a combination of groundwater and of surface water imported and treated by the Metropolitan Water District of Southern California (MWD). LBWD has a right to both of these sources of water.

A. SUPPLEMENTAL WATER SUPPLY

MWD is the "supplemental" supplier of water for LBWD and the other 25 MWD member agencies that supply water to the 18 million people of the southern California coastal-plain. As our supplemental supplier of water, MWD provides the extra water LBWD needs to meet the City's water demands; if the LBWD supplies increase, it purchases less MWD water, if its supplies decrease, it purchases more.

Due to its significant investments and long-term planning, MWD expects to fulfill its obligations as the supplemental supplier, by being 100-percent reliable through the year 2030. According to MWD's 2005 RUWMP, Section II.3 and II.4:

> *These tables (Table II-7 and Table II-8) show that the region can provide reliable water supplies under both the single driest year and the multiple dry year hydrologies. Table II-9 reports the expected situation on average over all of the historic hydrologies. Appendix A-3 contains detailed justifications for the sources of supply used for this analysis. The reliability analyses in the IRP Update report showed that Metropolitan can maintain reliable supplies under the conditions that have existed in past dry periods throughout the period 2010 through 2025. As the tables provided below (Table II-7, Table II-8 and Table II-9) show, that level of reliability extends through 2030. Metropolitan has also identified*

buffer supplies, including additional SWP groundwater storage and transfers that could serve to supply the additional water needed.

"Through effective management of its water supply, Metropolitan fully expects to be 100 percent reliable in meeting all nondiscounted non-interruptible demands throughout the next twenty-five years.

Furthermore, LBWD has a right to the imported drinking water it expects to purchase wholesale from the MWD. This entitlement is embedded in State law and comes in the form of a preferential right to MWD supplies except during times of extreme emergencies. Section 135 of the Metropolitan Water District Act states:

Sec. 135. [Preferential Right to Purchase Water]

Each member public agency shall have a preferential right to purchase from the district for distribution by such agency, or any public utility therein empowered by such agency for the purposes, for domestic and municipal uses within the agency a portion of the water served by the district which shall, from time to time, bear the same ratio to all of the water supply of the district as the total accumulation of amounts paid by such agency to the district on tax assessments and otherwise, excepting purchase of water, toward the capital cost and operating expense of the district's works shall bear to the total payments received by the district on account of tax assessments and otherwise, excepting purchase of water, toward such capital cost and operating expense.

The MWD recalculates each of its member agency's preferential rights on an annual basis. According to the 2005 calculation, LBWD's rights to MWD imported water are as follows:

LBWD's Preferential Rights as a Percent of MWD's Imported Water	2.61%
Mimimum MWD Supplies even in the most severe and prolonged hydrologic conditions*	1,500,000 af / year
LBWD's Preferential Rights	39,150 af / year

* MWD dry-year suppliles would include imported water, stored water, water purchased on the spot market, etc.

The previous calculation assumes what experts believe is the absolute minimum supplies MWD could have available for its wholesale customers during a worse-case scenario of very harsh hydrological conditions that limit imported water supplies over a long period of time. It is not expected that MWD's supplies will ever fall to this level.

The amount of water represented by LBWD's Preferential Rights, as shown above, exceeds the demand for water on the LBWD during these conditions.

LBWD does not always pump its annual pumping rights. Some years it participates in a voluntary program to "retire" pumping rights for the sake of replenishing the groundwater basin. In exchange for using its pumping rights to replenish the groundwater basin, the Water Replenishment District of Southern California (WRD) provides a financial incentive and the MWD allows LBWD to purchase replacement water at a discount. LBWD expects to continue to participate in this worthwhile and cost effective program in the future. However, because this in-lieu program depends on both the availability of surplus MWD imported supplies and WRD in-lieu replenishment incentives, LBWD does not include the in-lieu program in its future projections.

Table 3 – Water Supply

Fiscal Year	1985	1990	1995	2000	2005*	2010	2015	2020	2025	2030
Groundwater	25,749	28,090	16,625	24,582	25,955	32,684	32,684	32,684	32,684	32,684
Dealinated Seawater						5,000	10,000	10,000	10,000	10,000
Wholesale - MWD	48,951	47,028	49,997	46,475	43,939	35,658	30,758	31,912	30,488	29,616
Potable^	74,700	75,118	66,622	71,057	69,894	73,342	73,442	74,596	73,172	72,200
Reclaimed	2,471	3,992	2,992	5,190	5,210	6,458	8,058	9,604	12,428	14,400
Grand Total	77,171	79,110	69,614	76,247	75,104	79,800	81,500	84,200	85,600	86,600

* *Estimate used in the 2005 UWMP.*
^ *Excludes water sales to WRD for the seawater barrier.*

B. GROUNDWATER SUPPLY

LBWD has a right to extract 32,684 acre-feet of groundwater each year. A discussion of this right and of the groundwater basin follows in the section titled *Groundwater Location, Amount, and Sufficiency*, below.

1. Groundwater Location, Amount, and Sufficiency

A portion of LBWD's water supply to the Project will be treated groundwater. The location of the groundwater pumped by the LBWD is the Central Basin aquifer. A description of the Central Basin is included in the Watermaster Services annual report, a copy of which is in the Appendix. This basin was adjudicated in 1965. The adjudication limits the amount of water allowable to be extracted in any given year from the basin and assigns the right, or "Allowable Pumping Allocation" or APA, to extract that water to specified parties. The specified parties have the right to sell and to lease some or all of their APA. LBWD was awarded certain APA rights at the time of the adjudication and has purchased additional APA since that time, accumulating 32,684 acre-feet APA per year as of the date of this assessment.

Because the sum total of all the water that can be legally extracted from the Central Basin in a given year (i.e., the total APA) exceeds the basin's natural yield, the adjudication specified that the Water Replenishment District of Southern California (WRD) (known at the time of the adjudication as the *West and Central Basin Replenishment District*) would be the responsible agency for replenishment of the Central Basin. WRD replenishes the groundwater basin in several ways, including a spreading operation and through in-lieu replenishment. The adjudication provided WRD a means to finance the replenishment operations by allowing it to levy a tax on water extracted from the basin.

The Central Basin had been in an overdraft condition prior to 1965; since the imposition of adjudication's extraction limitations and the replenishment operations of the WRD, the groundwater basin has recovered significantly from its pre-1965 levels. Additional information about the replenishment operations and condition of the groundwater basin can be found in the 2005 UWMP. This document includes a description of the groundwater basin, the water demands for the cities overlaying the basin, a list of the owners of water rights, a discussion of the replenishment operations, the active wells and their locations, as well as information concerning the current and historic water levels.

LBWD extracts virtually all of its groundwater from the Central Basin. It is reasonable to assume that LBWD will encounter no difficulties extracting this groundwater over the next 20 years, for the following combination of factors:

- The Central Basin adjudication prevent over-drafting by imposing strict limits on groundwater extraction,
- The adjudication has imposed upon WRD the mandate to provide for the continual replenishment of the basin,
- WRD has fulfilled this mandate well, increasing the amount of water stored in the basin since the time of the adjudication, and
- WRD is expected to continue to maintain the groundwater level in the basin in the future, given its mandate and access to resources through the fee it imposes whenever water is extracted.

Table 4 shows the amount of water extracted from the Central Basin by the LBWD for each of the last seven fiscal years.

Table 4 – LBWD Groundwater Extractions

Fiscal Year Ending Sept 30...

	1999	2000	2001	2002	2003	2004	2005*
Acre-feet Extracted	23,397	24,582	24,326	25,803	23,003	25,639	25,955

** Estimate used in the 2005 UWMP*

C. DOCUMENTING SUPPLIES IF SUPPLIES NEVER BEFORE USED

The supplies expected to be used by the Project have been used in the past with the exception of, potentially, water from projects the MWD anticipates implementing in the future to meet additional demands placed upon it. MWD in its 2005 RUWMP provides the requisite documentation. The other possible source of supply would be from seawater desalination as documented in the LBWD 2005 UWMP. Seawater desalination developed in Long Beach within the timeframe currently projected is not material to LBWD's ability to supply water to the existing nor planned/ projected demands because the MWD considered supply development uncertainty in the development of its Integrated Resources Plan and RUWMP. The supply buffer "over plans" for the development of water projects knowing that a certain percent will not materialize within the timeframe first anticipated.

D. WATER DEMAND

As stated above, because the type of development such as the proposed development was included as part of the projected water demand of the current adopted 2005 UWMP, the water demand for the proposed development need not be separately analyzed.

Table 2 shows the water-demand projections of the Project.

The LBWD 2005 UWMP demand estimates were based, in part, on estimates of population growth. The following table showed these UWMP estimates in 5-year increments. These estimates were based on historical trends and data from the City of Long Beach and the Southern California Association of Governments.

Table 5 – Population of City of Long Beach

	FY Ending September						
	2000	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
Population	459,500	490,100	506,100	521,500	536,600	551,000	564,900
Multi-Family Housing		89,703	94,208	99,716	103,440	107,199	112,716
Employment		199,473	212,604	221,287	229,441	237,049	244,377

Long Beach is an urban coastal community within the southern California coastal plain. As such it has a temperate "Mediterranean" climate distinguished by wet winters and dry, warm summers. The average annual rainfall for the region is approximately 14 inches but fluctuates between less than 4 inches and greater than 35.

By water industry standards Long Beach is considered a "built out city;" meaning there is little undeveloped land and that new development will almost always be in the form of in-fill or replacement of existing development. Therefore, some of the water demanded by the new development tends to replace the previous demand at the site; that is, all the water needed by the development is not "new demand" on the system.

Based on the population estimates and other factors, the UWMP provided the estimates found in Table 6, below, of potable and reclaimed water use by sector. Water use data is only broken down into the following sectors.

Table 6 – Water Demand

Estimated and projected demand by sector (in acre-feet)

Fiscal Year	1990	1995	2000	2005	2010	2015	2020	2025	2030
SFR	55,283	47,872	50,254	25,435	27,026	27,601	28,516	28,990	29,329
MFR	16,516	15,284	17,547	26,570	28,231	28,832	29,788	30,283	30,637
Misc./ Agg.	658	604	1,605	3,268	3,472	3,546	3,664	3,725	3,768
Comm/ Ind	6,653	5,854	6,841	19,832	21,071	21,519	22,232	22,602	22,867
Total	79,110	69,614	76,247	75,105	79,800	81,498	84,200	85,600	86,601

E. DRY YEAR SUPPLIES

LBWD's dry-year supplies and demands are well documented in its 2005 UWMP and are incorporated into this document by reference. LBWD has two sources of domestic water: groundwater and imported MWD supplies, and expects to be desalinating seawater in less than ten years. The desalinated seawater is not factored into this assessment because, as shown below, the combination of reliable groundwater and of imported drinking water (which incorporates the concept of a supply buffer) provide for a very reliable water supply.

Both the groundwater and the MWD supplies are reliable in normal and in multiple dry years as the following discussion makes clear. As documented in the 2005 UWMP, the total projected water supplies available during normal, single dry and multiple dry-years, during a 20-year projection of water demand associated with the proposed project, in addition to the LBWD existing and planned future users, including agriculture and manufacturing uses, are adequate.

1. Groundwater Reliability

The groundwater supplies are extremely reliable because the amount of water stored in the basin is very significant, because the basin is adjudicated (limited extractions), and because the WRD is charged with replenishing the basin in a timely manner. Therefore, the groundwater supplies are not expected to be limited by single nor multiple dry-year events.

The average annual rainfall in the LA basin over the last 125 years is 14.97 inches per year. If a "dry year" is considered 13 inches or less, a fairly conservative number, there have been only three events of 4 or more dry years in a row during this period: the four years including 1928 through 1931; the seven years including 1945 through 1951; and the five years including 1987 through 1991.[1]

For the purposes of the assessment of the impact of four consecutive dry years, the most useful period was the most recent, from 1987 through 1991. The two previous dry-year periods took place before the groundwater basin was adjudicated, before there was a systematic means of replenishing the groundwater basin, and before good records of the water table elevations were available.

The five-year 1987 through 1991 drought was more severe than the 4-year analysis required in the assessment, yet a reduction in groundwater production was not required and the water table remained above the pre-adjudication level in each of the four monitoring wells tracked by the Watermaster (see the Appendix'ed *Watermaster Service*, page 26).

2. MWD Water Reliability

As noted in its current Regional Urban Water Management Plan, due to its significant investments and long-term planning, MWD expects to fulfill its obligations as the supplemental supplier, by being 100-percent reliable through the year 2030 (see the reference in Section III.A, above) This report anticipates multiple dry year events.

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[1] These "years" began on July 1 and ended June 30th of the year noted. For example, the year "1928" began July 1, 1927 and ended June 30, 1928.

3. *Additional Water Reliability*

In addition to groundwater and MWD supplemental supplies, LBWD is seeking to increase its recycled water distribution system in order to switch more users from potable water to recycled water, to aggressively expand its water conservation program to limit domestic water demands, and to meet the drinking water needs of about 1 of 7 LBWD customers with desalinated seawater in less than 10 years.

F. DRY YEAR DEMAND

The average annual rainfall in Long Beach during the 30-year period 1975 through 2005 is 12.74 inches (Table 7). The long-term average in Los Angeles during the 127-year period 1878 through 2005 is 14.94 inches. The average annual population increase in Long Beach has been about 1.1-percent (1.1%) per year, yet the average annual increase in potable water demand has just been 0.1-percent (0.1%).

Table 7

Average Annual:

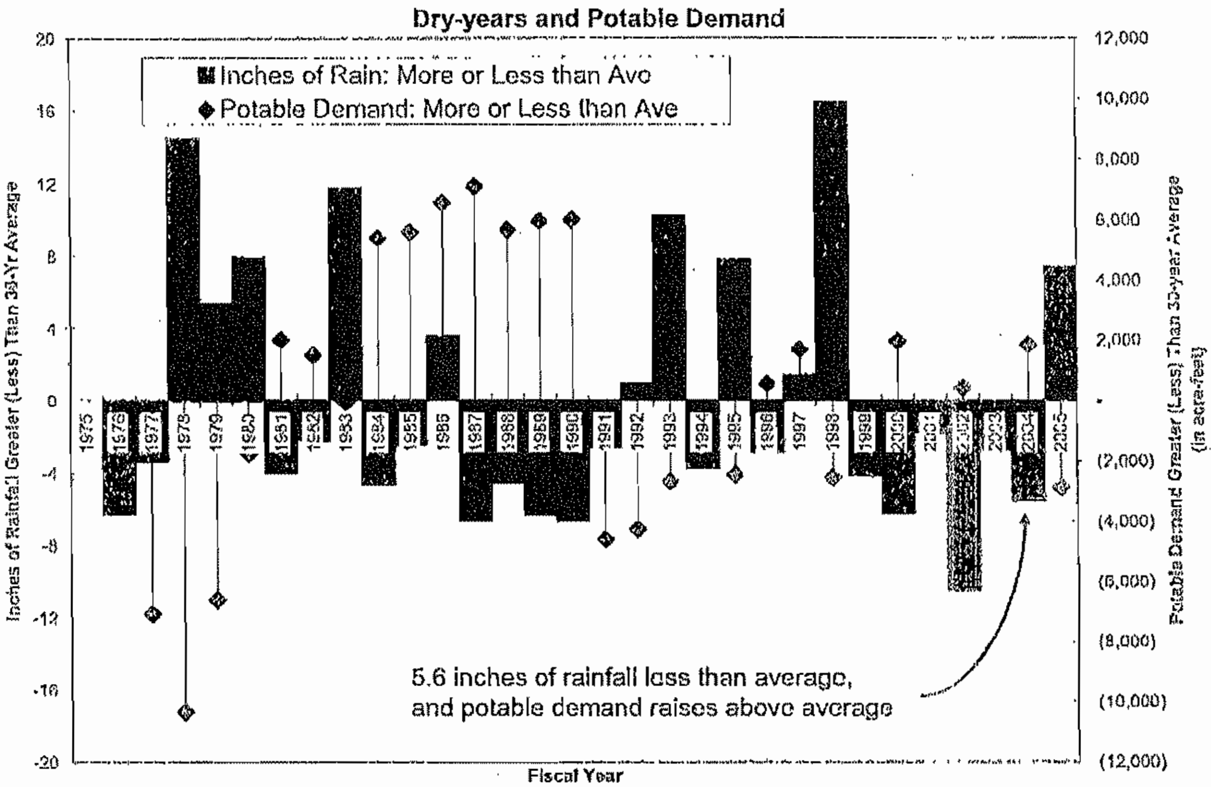
12.74	:Average annual Rainfall in Long Beach over 30-year period beginning 1975, in inches
14.94	:Annual Average Rainfall in LA since 1878, in inches
1.1%	:Annual average Population Increase
0.1%	:Annual average Potable Water Demand Increase

During this thirty-year period, demand for water decreased by about 227 acre-feet per year for every one inch of rainfall, but this is only an average. The expectation is that when rainfall is less than average, demand will be greater than average. As Chart 1 shows, that was not always the case during this 30-year period; highlighting the fact that making predictions about demand during dry periods come with a lot of uncertainty. There have been three 2-year periods of less than average rain, one 5-year period, and one 6-year period during these 30-years.

- 2 dry years 1976-77: demand below average
- 2 dry years 1981-82: demand above average
- 5 dry years 1987-91: demand above average until the last year of the drought, when demand fell below average.

- 6 dry years 1999-2004: Demand fluctuated above and below but near the average

Chart 1



There was a big shock to the water supply systems in the late 1980's and early 1990's, when southern California experienced a drought and water supply shortage. Since that time water conservation and the use of reclaimed water have greatly expanded. These two trends very likely explain why, during six years of less than average rainfall beginning in 1999, demand for potable water was only slightly up some years and slightly down in others.

Unlike the past, a lack of rainfall is no longer a good predictor of increased demand for potable water. If we just look at the years prior to the water shortage of the early 1990's, we probably would have assumed that demand increases with the first dry year and stays at about the same level throughout the drought. That is, whether a single dry-year or a multiple dry-year event, demand would remain about the same higher-than-average level. Since the 1990 shortage, it looks like the swings in demand have been dampened and dry-year conditions are no longer good predictors of changes in demand. As shown on Table 8, demand was *less than average* in four of the eight dry years since the 1990's drought. Chart 1 shows that demand rose above the average in years subsequent to the early 1990's only when rainfall was about 7 inches or less (the average being about 13 inches of rainfall). There have only been 14 instances of 7.1 inches of rain or less since 1878; and only 2 sets (of 2 years each) were consecutive. Therefore, it would appear that multiple dry years of the type that increase demand on potable water are infrequent and rarely happen consecutively.

In conclusion, predictions of the impact of dry years on demand for potable water come with a great deal of uncertainty.

Dry year supplies and demands are discussed in the 2005 UWMP. But looking at the recent 6-year multiple dry-year period, we say that annual potable demand averaged just 123 acre-feet above the 30-year average demand, even as the population of Long Beach increased significantly. If we look at just the three-in-six years where demand was above the 30-year average, we see that it represented an average increase of 1,408 acre-feet (the trend was *not* one of increasingly higher demands as the dry period persisted). The worst-case scenario of this new post-1990's shortage demand profile would be when demand is higher in each of the dry years of a multiple dry-year period by the average of these high demand years: 1,408 acre-feet.

When dry-year demands are average, these increases are accommodated in several ways. Per the Central Basin judgement LBWD has rights in the groundwater basin to store in excess of 6,000 acre-feet, or more than four times the increased demand (1,408 acre-feet). Additionally, as stated above, MWD has assured its member agencies (such as Long Beach) that it can meet projected water demands for the next twenty years.

IV. PROJECT ASSESSMENT

As shown above and in the 2005 UWMP, LBWD will have the resources to meet the demand of the Project in hydrologically normal and dry-year events. The following table shows that the supply of supplemental water will increase to accommodate the demands of the Project. The reliability of the supplemental supply reflects MWD's reliability and MWD's commitment to regional water reliability. Not shown but available is LBWD's right to pump its carryover storage and to access other groundwater supplies in case of emergency per the adjudication of the basin.

Table 8 shows that, because of the net impact from the Project, current demand for potable water would rise during dry years by about 136 acre-feet, or roughly 2/10th of one-percent (0.2%) of the LBWD water supplies.

Table 8 – Current Potable Demands and Dry-year Supplies

	Normal Year	1st Dry Yr	2nd Dry Yr	3rd Dry Yr	4th Dry Yr
Without Project					
Groundwater Supplies	32,684	32,684	32,684	32,684	32,684
Wholesale - MWD	37,316	38,724	38,724	38,724	38,724
Less non-Project Demand	(70,000)	(71,408)	(71,408)	(71,408)	(71,408)
Balance	-	-	-	-	-
With Project					
Groundwater Supplies	32,684	32,684	32,684	32,684	32,684
Wholesale - MWD	37,449	38,860	38,860	38,860	38,860
Less Project Demand*	(133)	(136)	(136)	(136)	(136)
Less non-Project Demand	(70,000)	(71,408)	(71,408)	(71,408)	(71,408)
Balance	-	-	-	-	-

* Assumes net increase in demand on LBWD due to Project, and that Project demands, like all other demands, are up by 2% due to dry-year conditions. worse-case scenario of consecutive dry weather without extraordinary "dry year conservation."

Table 9 shows the impact of the Project on future supplies and demand during multiple dry-years. The LBWD 2005 UWMP projected demand 20 years into the future. This demand forecast incorporated the type of new demand the Project represents. Therefore, the "With Project" sections of Table 9 show the same overall total demand for potable water as shown in Table 3; the "Without Project" section shows demand minus expected Project demand. That is, the Project will not have an impact on the supply and demand for water in the fiscal year 2025 as the Project's demand has been anticipated in the 2005 UWMP:

Table 9 – Future Potable Demands and Dry-year Supplies

	Normal Year	1st Dry Yr	2nd Dry Yr	3rd Dry Yr	4th Dry Yr
With out Project					
Supply	73,172	74,635	74,635	74,635	74,635
Less non-Project Demand	(73,172)	(74,635)	(74,635)	(74,635)	(74,635)
Balance	-	-	-	-	-
With Project					
Supply	73,172	74,635	74,635	74,635	74,635
Less Project Demand	(133)	(136)	(136)	(136)	(136)
Less non-Project Demand	(73,039)	(74,500)	(74,500)	(74,500)	(74,500)
Balance	-	-	-	-	-

V. THE PROJECT EXEMPT FROM SB 221

This Project is a subdivision as defined by Government Code section 66473.7 (a)(1) having more than 500 dwelling units when the public water system (LBWD) has more than 5,000 services:

> *(a)(1) "Subdivision" means a proposed residential development of more than 500 dwelling units, except that for a public water system that has fewer than 5,000 service connections…*

The Project, although defined as a "subdivision," is exempt from SB 221 because it will be developed at a site within an urbanized area that had been previously developed for urban use. It is further exempted because the immediate contiguous properties surrounding the proposed Project site are, or previously have been, developed for urban uses. Government Code section 66473.7(i) states:

> *(i) This Section shall not apply to any residential project for a site that is within an urbanized area and has been previously developed for urban use, or where the immediate contiguous*

properties surrounding the residential project site are, or previously have been, developed for urban uses....

As depicted in the following attachment, the current site of the proposed Project is within an urbanized area and is currently developed, and that the immediate contiguous properties surrounding the Project are developed for urban uses.

VI. APPENDIX

A. **Lead Agency Memo Requesting Water Supply Assessment**

B. **Lead Agency Notice of Preparation of a Draft Environmental Impact Report**

D. **Long Beach Water Department 2005 Urban Water Management Plan (CD)**

Appendix A. Lead Agency Memo Requesting Water Supply Assessment.

City of Long Beach
Working Together to Serve

Memorandum

LONG BEACH
WATER DEPT

2006 MAY 10 PM 12: 19

Date: May 10, 2006

To: Matthew Lyons, Water Department

From: Angela Reynolds, Planning and Building Department

Subject: **Water Supply Assessment for the Press-Telegram Mixed Use Project EIR**

Because this project is subject to CEQA and would result in the development of 500 dwelling units or more, or the equivalent water demand of 500 units or more, an SB 610 Water Supply Assessment (WSA) must be prepared and adopted by the local water supplier, at the request of the lead agency.

This memorandum shall serve as a formal request that the Water Department prepare the Water Supply Assessment (WSA) for the Press-Telegram Mixed Use Project EIR.

Attached is a copy of the Notice of Preparation previously sent to your department, which includes the project location and description, for use in the WSA preparation and adoption.

If you have questions about this matter please contact me at 8-6357.

Appendix B. Lead Agency Notice of Preparation of a Draft Environmental Impact Report.

Notice of Preparation

TO:		FROM:	City of Long Beach
			Division of Planning and Building
			333 Ocean Boulevard, 7th Floor
			Long Beach, CA 90802

Subject: Notice of Preparation of a Draft Environmental Impact Report

Project Title: Press-Telegram Mixed Use Development

Project Sponsor: City of Long Beach, Division of Planning and Building

The City of Long Beach will be the Lead Agency for preparation of an Environmental Impact Report (EIR) on the Press-Telegram Mixed Use Development project. The project proposal calls for construction of 542 residential units in two high-rise towers. A four- to eight story podium would surround both the towers and the general perimeter of the site. Both towers would be 22 stories and 250 feet in height. The project would also include 13,000 square feet of ground floor commercial space and 1,084 on-site parking spaces in a new parking structure consisting of four above-ground levels and three subterranean levels. The approximately 2.5 acre project site is located at 604 Pine Avenue and encompasses one full downtown block (bisected by Tribune Court, an alley) which is bordered on the east by Locust Avenue, on the north by 7th Street, on the west by Pine Avenue, and on the south by 6th Street. The existing façade of the Meeker Building (also known as the Baker Building), a City-designated historic landmark located on the southeast corner of 7th Street and Pine Avenue, and portions of the existing interior of the Press-Telegram Building and its façade, would be preserved and restored to their respective original conditions. Primary vehicular access to the project would be taken from Locust Avenue and 7th Street.

The project site is located in the Downtown Mixed Use District of the Downtown Planned Development District (PD-30). Entitlements being requested include a zoning ordinance amendment, site plan review, tentative subdivision map, and standards variance. The zoning ordinance amendment is requested to change zoning height and density limitations in the downtown mixed-use district, which currently allows 75 units per acre and a maximum height of 100 feet. The proposed project would have a density of approximately 217 units per acre and a height of 250 feet. The standards variance is requested to allow for less than the required number of parking spaces.

The City of Long Beach invites your comments as to the scope and content of the environmental information that is germane to your agency's statutory responsibilities in connection with the proposed project. Some state and local agencies may need to use the EIR prepared by our agency when considering your permit or other approval of certain aspects of the project.

Probable environmental effects in the issue areas of aesthetics, shadows, light and glare, air quality (including wind tunneling), historic resources, geology/soils, hazards/hazardous materials, land use/planning, noise, population/housing, public services, transportation/ traffic and utilities/service systems have been identified in the Initial Study. Additional information related to the project description, location, and the anticipated environmental effects are included in Initial Study, which is attached herewith.

Scoping Meeting. The City of Long Beach, in its role as a Lead Agency, will hold a public Scoping Meeting to provide an opportunity for the public and for representatives of public agencies to address the scope of the Environmental Impact Report. The Scoping Meeting for the Environmental Impact Report for the Press-Telegram Mixed Use Development project is scheduled for **Thursday, April 13, at 6:30 p.m.** at the following address:

First Congregational Church, Patterson Hall
241 Cedar Avenue
Long Beach CA 90802

Thirty-Day Comment Period: Due to the time limits mandated by State law, your response must be sent at the earliest possible date but not later than 30 days after receipt of this notice. The Notice of Preparation/Initial Study comment period begins on Wednesday, March 29th, 2006 and ends on Thursday, April 27th, 2006.

Please send your comments by regular mail, email or fax to:

Angela Reynolds
Environmental Officer
City of Long Beach
Division of Planning and Building
333 Ocean Boulevard, 7th Floor
Long Beach, CA 90802

Fax: (562) 570-6068

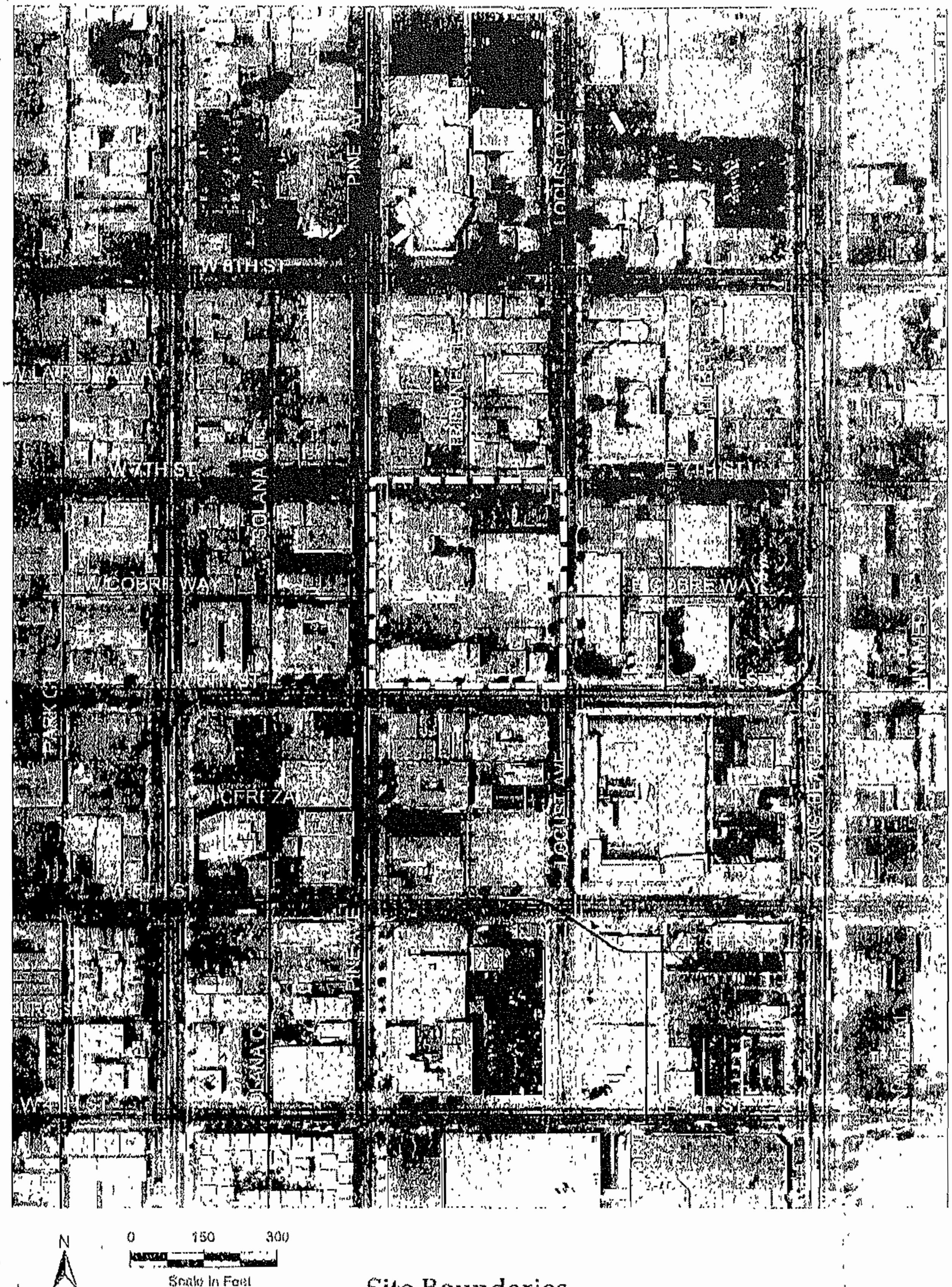
Email: Angela_Reynolds@longbeach.gov

Date: Wednesday, March 29, 2006

Signature

Title Environmental Officer

Telephone (562) 570-6357



Site Boundaries

Figure 3

Appendix C. Long Beach Water Department 2005 Urban Water Management Plan (CD)

Please find the attached compact disc for a copy of the LBWD current adopted 2005 Urban Water Management Plan.

(End of Water Availability Assessment)